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ICCP Concedes It Lacks Certification Resources

By Katherine Hafner
CW Staff

CHICAGO — The Institute for Certification of Computer Professionals has acknowledged that it "lacks the necessary resources" to develop many of the new certification programs springing up for the computing and information systems profession.

The concession came in a position paper published recently by ICCP to clarify its stance on certification. In the same paper, ICCP also stated that it "recognizes that certification alone is not a complete measure of professional competence ... Testing has its greatest applicability in the area of knowledge measurement, but can be used to measure other aspects of professional competence ... such as applied judgment, professional attitudes and abilities."

In the position paper, the ICCP — which administers the exams for the Certificate in Data Processing and Certificate in Computer Programming — conceded that it will not be able to develop a number of new certification programs because it "lacks the necessary resources" in the form of support from business. At the same time, the ICCP said it will "promote the highest standards for development and administration of responsive certification programs" and suggested four different categories of certification:

- **Capstone:** a senior certification awarded to "professionals who have distinguished themselves through outstanding accomplishment and demonstrated knowledge."
- **Specialist:** a certification directed toward specific areas.

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COMPUTERWORLD
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NEWSPAPER

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An agreement between Burroughs Corp. and the University of Nevada is under fire. Burroughs will donate $1.5 million in DP equipment and services to the University of Nevada; in return, the university has agreed to purchase $2.9 million worth of Burroughs equipment and services. Page 4.

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A "condominium-type" fiber-optic network dubbed Lightnet will be built by Southern New England Telephone Co. and CSX, Inc. Page 11.

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Concern for safeguarding proprietary software programs has reached unprecedented proportions among users and vendors alike. *Computerworld* takes a closer look at the issue. Page 13.

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IBM 3270-compatible network controller/terminal systems that can handle up to 120 peripheral devices — nearly four times the current industry standard — have been introduced by The Braegen Corp. Page 49.

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Can the Big Eight offer DP services and products to their audit clients? The Association of Data Processing Service Organizations has asked for a ruling. Page 65.

SPECIAL REPORT

Inside — Fine Tuning the Terminal Picture

User Builds Micro Station, Ties It to IBM Mainframes

By Paul Gillin
CW Staff

TORONTO — The DP department at Imperial Oil Ltd. here has succeeded in linking microcomputers to mainframes in a project that developers say could revolutionize the ways in which data is communicated and analyzed by users at dozens of company offices nationwide.

Imperial Oil's Office Technology Services Group last week released to a slice of corporate users a prototype of its integrated Workstation, a system based on the IBM Personal Computer. The Integrated Workstation integrates electronic mail and file management capabilities using a link to IBM 3080 series mainframes at the Imperial Oil data center here.

The workstation allows users to exchange electronic mail, spreadsheet models and eventually application programs among each other and between their workstations and the mainframe.

The tie to the mainframe is accomplished with Tempus-Link from Micro Tempus, Inc. of Montreal. Tempus-Link is an intelligent file-sharing software package for IBM mainframes that allows users to download data from corporate data bases, share and update data base information and connect to on-line applications.

The product also creates "virtual floppy disks," Vsam files resident on the mainframe that act as an extension of Personal Computer storage. The virtual floppies can be accessed by the mainframe or by Personal Computer users under IBM's PC-DOS operating system.

The Integrated Workstation uses the mainframe to extend dramatically the amount of disk storage available to the micro, according to project developers. In addition to electronic mail facilities, the link also allows users to exchange completed financial models and tem-

(Continued on Page 6)

If You Don't Have A Policy on Micros, You're in the Minority

By Peter Bartolik, Patricia Keefe And Bill Laberis
CW Staff

Does your DP shop or business have a policy governing the acquisition and use of personal computers?

If not, you are in a distinct minority.

Furthermore, your company is running the risk of throwing money down the personal computer drain if it is not planning for a fully integrated and networked information system.

These are some of the conclusions drawn from two recent studies and corroborated by an informal *Computerworld* poll of 28 managers of large DP installations. Nineteen — 70% — of the 28 shops contacted in the CW survey have written policies or have general operating guidelines in place relating to the purchase and/or use of personal computers. Of the remaining nine shops, six are either in the process of composing guidelines or are planning to do so in the near term. Only three shops have no policy in place and no plans to implement one.

Those findings mirror a recent research report from International Resource Development, a Norwalk, Conn.-based market research company which determined that "almost all major corporations have now established guidelines, loose or rigid, for their employees' procurement of personal computer and word processing hardware." The report further states that the most popular guideline is to approve no more than three vendors: in almost all cases, IBM is one of the three.

A second study, this one covering 124 Fortune-type companies and prepared by Newton-Evans Research Co., found that 75% of the companies polled either have or are planning a corporate policy for acquiring and using personal computers. That study also found that DP shops serving the finance and insurance business tend to give

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Some DP Shops Destroyed

Alicia Leaves Checkered Path

By Katherine Hafner
CW Staff

GALVESTON, Texas — Hurricane Alicia left a checkered path of wreckage at DP sites on Galveston Island. Some installations emerged from the storm virtually unscathed. Others were devastated.

The Galveston County data processing center here suffered the most when part of the building collapsed through the roof of a lower floor at 2 a.m. on Thursday, Aug. 18, and crashed into the computer room.

"Where we're located is wider than the rest of the building," explained Alford Cogbill, data processing manager for the county. "The upper floors just collapsed and punched through our roof."

The center's Honeywell, Inc. Level 64 mainframe, which contains tax appraisal, payroll, accounts payable and jury selection information for the county of 200,000 people, sustained extensive water damage. It will be down for at least another week, Cogbill said.

In addition, the area of the computer center containing the county's disk packs were completely ruined by water damage.

Fortunately, the county was prepared with a disaster plan for processing critical information such as payroll and accounts payable. It is using another Honeywell machine at U.S. Home Corp. in nearby Houston, where Alicia did relatively less harm. Cogbill said no decision has yet been made whether to replace or repair the damaged machine.

Other DP sites on the island were more fortunate, suffering mostly from the power outage, which lasted several days in some areas.

American Indemnity Co., which operates IBM 4341 and Control Data Corp. Omega 480 mainframes, fell a week behind in its work, but the computer room was not damaged. "We had a window blow out on the same floor the computer room is on, which caused ceiling panels to blow out, but it didn't hurt the computer room," reported Leroy Gathman, the company's data center manager.

American National Insurance Co., another large Galveston company with 1,500 employees, also managed to escape the hurricane's wrath. "We lost power when she hit early Thursday morning, but we got it back by Friday," said Charles Addison, senior vice-president of systems planning and computing for American National, which owns two Amdahl Corp. mainframes, a Model 470V/6 and 470V/7.

"We were extremely fortunate, although we had a good deal of wind damage to the building," Addison said. "We didn't have much damage to the computer except [problems] with the residue that forms when you have high temperatures and condensation. We've got about two days of backlog work, but we'll be caught up by the end of the week."

Tom Epley, manager of operational services at the University of Texas Medical Branch in Galveston, prepared for the worst but was "incredibly lucky." The Medical Branch is equipped with IBM 3081 and 3033 mainframes that process the university's hospital information system.

"We lost our power on Wednesday night and got it back by Friday afternoon. We had chilled water Friday night, and by 8 a.m. the next day the system came right up and everything worked," Epley said.

"We knew the building wouldn't go because it's so strong, but we weren't sure about water damage. The roof did leak, but it was on the opposite side of the building. It's unbelievable," he said.

Sperry 1100 Mainframes Get Micro-Like Spreadsheet

BLUE BELL, Pa. — Sperry Corp. has announced an electronic spreadsheet for its 1100 series of mainframes.

Sperry Calc 1100 offers capabilities similar to those of microcomputer-based spreadsheet packages, a spokesman said. It incorporates a 511 by 511 two-dimensional matrix with vertical and horizontal windowing.

The product is compatible with, but does not require Sperry's Mapper application development system. Information can be retrieved from Mapper, updated and replaced, the spokesman said. All commands can be abbreviated to three letters. The product also incorporates extensive Help facilities.

Sperry Calc 1100 is compatible with Sperry UTS 20, UTS 30, UTS 40 and UTS 400 terminals. Password security is defined by a coordinator at the logon, spreadsheet and individual cell levels. The coordinator can also define the maximum number of concurrent users who can access Sperry Calc 1100.

Delivery is planned for September. The product is priced at $5,000 for the Sperry 1100/60 and 1100/70 and $7,000 for the 1100/80 and 1100/90. Sperry can be contacted through P.O. Box 500, Blue Bell, Pa. 19424.

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Joint Venture or Purchase?

University's Pact With Burroughs Under Fire

By Peter Bartolik
CW Staff

RENO, Nev. — A "joint venture" that the state university system has formed with Burrougha Corp. has raised eyebrows around the state.

Burroughs announced in March that it would donate $1.5 million in computer equipment and services to the University of Nevada and that in return the university had agreed to purchase $2.9 million in unrelated equipment and services. The arrangement could go into effect before the end of the year.

Members of the university faculty, university regents and a atate assemblyman have raised questions about academic freedom and waiver of bidding procedures. But Chancellor Robert M. Bersi maintained last week that those concerns result from "an absence of understanding."

Bersi told *Computerworld* that the equipment purchase snd software development arrangement is a "cooperative agreement" rather than a purchase. Bersi said the university regents directed him, when he assumed his position three years ago, to establish a modern management information system (MIS), and he sought a vendor who would take "a vested interest" in the university.

The university encompasses two campuses at Reno and Las Vegas, four community colleges and a medical research institute. Administration for all campuses is centralized in the chancellor'a office in Reno.

Since Bersi's administration began, the university has acquired Control Data Corp. Cyber 730 and 172 mainframes, two Harris Corp. H-800 superminis and half a dozen Digital Equipment Corp. VAX-11/750 superminis. Exclusive of the Burroughs arrangement, the university has a $4 million annual operating budget for its computer operations and sn extensive telecommunications network that has been set up between the various campuses.

Agreement Stipulations

According to Burroughs and Dr. Lloyd Case, director of the university'a computer center, the five-year agreement stipulates that:

- Burroughs will donate for academic use a B5900 mainframe, five B20 microcomputers, about $500,000 worth of software and waiver of initial fees for Burroughs' Linc applications program generator.
- The university will purchase a dual B6900 mainframe system, along with software and services, to form an up-to-date MIS for the central administration.
- The university will test for Midwest Systems Group, s Burroughs division, a new line of MIS softwsre for educational institutions. Burroughs will have proprietary rights to, and may market in return for royalties, academic software that is developed by faculty members.

Both Burroughs and Case said, however, that the agreement is "flexible" and that the particular items may be redesignated as the university designa its system configuration.

Rumors about the arrangement developed because it is unique and because Nevada has a relatively small-town atmosphere, Case said, who called the arrangement "an attractive and unusual deal" that will enable the university to accomplish "a massive upgrade to our management systems." He added that members of the faculty have "classical concerns" about maintaining academic integrity snd fear diversion of instructional resources.

However, Bersi said the agreement gives the university "absolute control" over the equipment's use.

The *Reno Evening Gazette-Nevada Journal* this month charged that no money is svailable or has been desig-nated for the purchase and questioned the lack of bidding.

Bersi, who was questioned about the deal by the state Assembly'a Ways and Means Committee, said the money will come from regents' discretionary funds, gifts and grants over a five-year period. Moreover, Bersi noted that the regents, in three separate policy statements, have approved "cooperative arrangements."

Case said the bid requirement was lifted because "it wasn't a purchase; you don't run a joint venture through the purchasing process."

Smaller, 50% Less Costly to Run

STC Adds Tape Subsystem to Rival 3420

By Tom Henkel
CW Staff

NEW YORK — Storage Technology Corp. (STC) has unveiled the 4670, an IBM-compatible tape subsystem that features combined large-scale integration and microprocessor-based technology and a 200 in./sec start/stop drive. The drive was announced at a press conference held here last week.

Aimed at users of medium to large-scale IBM processors, the 4670 competes with IBM's 3420 Model 8 tape drive. However, STC claimed that its unit is 25% amaller and 50% less costly to operate and cool.

Like STC's earlier 4500 and 4800 series tape subsystems, the 4670 is available with an optional 32K-byte buffer that increases the unit's data transfer rate from 1.25M byte/sec to 3M byte/sec. STC noted that the accelerator can be adapted in the future to increase the data transfer rate to 6M byte/sec, supporting sn anticipated switch by IBM to a 6M byte/sec transfer rate on its larger and yet-to-be-announced processors.

The 4670 consists of two 9-track units. It also incorporates a microprocessor-driven tape control unit capable of performing both local and remote diagnostics and a 200 in./sec tape drive.

With the 32K-byte buffered accelerator option, the 4670 can be located up to 400 feet from the CPU. The accelerator is connected via the CPU'a data streaming channel. Previously, the firm's 200 in./sec tape drives could be located a maximum of 120 feet from the CPU, noted Jim Campbell, STC'a tape product manager.

With the accelerator, the 4670 tape subsystem can operate at IBM channel speeds. It is not necessary, however, to dedicate only 3M-byte channels to the subsystem. Two 1M-byte or two 1.5M-byte channels can also be used, STC said.

When more than one CPU is employed, a "two-by" option on the 4670 can be used in conjunction with the 32K-byte buffer to support up to four simultaneous read/write operations across two 3M-byte channels. STC said this can double or triple tape resource utilization.

Slave Tape Unit

Besides the 4670, STC also introduced a slave tape unit, the Model 4674, featuring the same 200 in./sec spee . as the 4670. The 4674 can be attached to the 4670 to expand tape storage and recording capabilities.

Up to seven 4674 tape drives can be linked together to produce an eight-drive configuration operating from a aingle controller, according to STC.

Both the 4670 and 4674 support IBM's 1,600 byte/in. phase-encoded and 6,250 byte/in. group code recording densities. Also, the 4670 and 4674 employ internal cabling that eliminates the need to install cables under a raised floor, STC said.

The 4674 is currently available in single- or double-density versions. The 4670 can, however, also support STC'a triple-density 4500 series tape drives.

The 4670 has a base price of $46,800. The 32K-byte buffer accelerator costs $12,000, and the two-by feature, which allows more than one CPU to access the tape subsystem, costs $6,000. The 4674 costs $20,850.

Lease rates for the 4670 range from $1,555 to $2,111/mo on a third-year term basia. The 4674 costs $711/mo, also for three years. Both lease plans include prime-shift maintenance.

Controlled ahipments of the tape subsystem will begin next month, with several hundred of the units available for shipment by the end of the year, according to STC. STC is headquartered at 2270 S. 88th St., Louisville, Colo. 80028.

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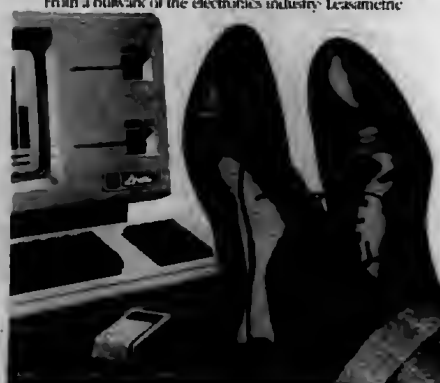

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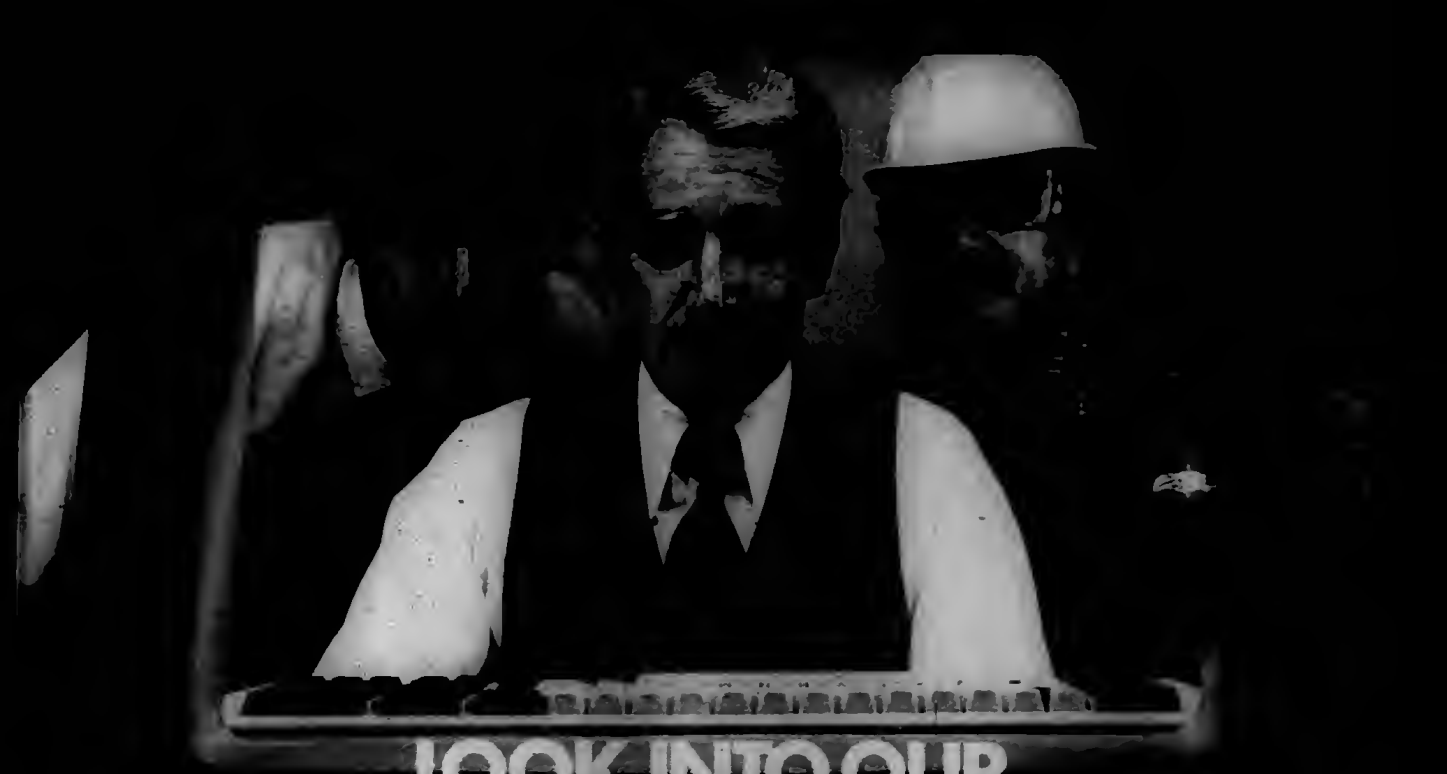

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Majority of Sites Have Micro Policy

(Continued from Page 1)

the greatest attention to personal computer planning.

Avoidance Measure

In general, DP managers told *Computerworld*, personal computer policies have been implemented as an avoidance measure. What they want to avoid is a hodgepodge of micros unable to communicate with the host or with one another.

However, very few shops reported anyone in their organizations using personal computers in anything but a stand-alone mode, despite the importance managers attached to planning for personal computers that can be networked or integrated into a mainframe environment.

Thomas Fleishman, information systems director at Kaiser Permanente Medical Care Programs, Inc. of Los Angeles, said the DP department has a policy in place to help users "get some understanding of how they [personal computers] are going to be used," particularly in Kaiser's mainframe environment. Data security considerations are among the personal computer planning concerns in his shop.

"We don't want to be viewed as putting obstructions in the way of people getting vehicles to enhance performance," Fleishman said, "but we have the nagging fear that eventually these things will proliferate, and if uncontrolled, there could be a large number of end users talking to each other and to the corporate data base ... If something should go wrong, we will have to pick up the pieces."

Kenneth Leckey, vice-president of computer operations at Pittsburgh National Corp., a Pittsburgh, Pa., financial institution, said his shop implemented a personal computer policy a year ago, refining it as more micros are purchased.

The key features of the policy include a DP steering committee, through which requests for personal computer and word processing purchases are funneled. The committee is comprised of senior executives from the user community, as well as DP executives.

In addition, personal computer purchase plans are subjected to a cost/benefit analysis, with the intended applications carefully scrutinized.

Getty Oil Co.'s Systems Engineering Department in Los Angeles intends to take the planning process to the computer store level, according to T.J. Joe Spencer, department manager.

Spencer said Getty, which has adopted the information center concept, will establish an in-house computer store, stocking a selected range of equipment as a means of controlling the machines bought. The store will be staffed by DP personnel who will advise end users.

The Royal Insurance Co. of New York requires end users who want personal computers to obtain the agreement of the company's system vice-president or DP vice-president. "If they can see a good reason, the user gets the [personal computer]," said John D. Kempter, vice-president of DP.

Royal now has one personal computer in its DP department and about 15 in its insurance division, where they are used by actuarial professionals for mathematical analysis and accounting purposes.

GSA Micro Plan: So Far, So Good

WASHINGTON, D.C. — Federal employees have found microcomputers help them make decisions faster and complete their work more quickly with better quality, according to the preliminary findings of a six-month government pilot study.

The General Services Administration (GSA), which is conducting the study at its offices here, said recently that after three months — halfway through the project — its experience "confirms that in-depth, hands-on training and ongoing availability of technical assistance are essential. Also, formal instruction in software selection and application are essential in managing the successful transition to microcomputer use."

The study was undertaken to help the GSA develop policies, regulations and plans for federal microcomputer use. Sixteen machines from four manufacturers were allotted to projects performing such functions as budgeting, financial management, equipment inventories, contract administration, document control, personnel and crime statistics and analysis.

User's Micro Station Tied to IBM Mainframes

(Continued from Page 1)

plates using shared mainframe Vsam files under CICS.

Under Tempus-Link and routines written by the workstation project team, users can store an almost unlimited amount of data in virtual floppies, explained Craig Ebert, project leader of the Integrated Workstation project.

Users are afforded access to three levels of storage. Data can be kept physically on floppy disks at the user's desk, stored in "desk drawers" or stored in a "file cabinet" on the mainframe. Desk drawers are an extension of the user's personal library and can be accessed only by the user, while the file cabinet contains data that is accessible by all authorized users on the network.

A directory of all files is maintained at the mainframe level and updated automatically. Users can download or copy data from the virtual disks for processing on the micro and later upload a new version of the file, without needing to know the intricacies of file access techniques or CICS, according to John Savage, senior programmer/analyst on the project.

"We've literally created our own directory of every diskette [that] is accessible from the micro," Savage said. "The user doesn't have to know where the diskette is or the technical specifics of downloading it. He can just retrieve it."

The company chose Tempus-Link after a scan of the market revealed that no sufficient micro to mainframe link was being shipped, Savage said. The requirements of Imperial Oil dictated that the link be independent of the communications environment.

Imperial Oil currently uses the Irma board coaxial interface from Digital Communicationa Associates, Inc., but "we don't want to be tied to one emulation type," Savage said. "If I'm up on a drilling rig, I want to be able to use dial-up or microwave and not be tied to coaxial technology." The company is currently using dial-up access from its western region.

Tempus-Link reportedly is compatible with a variety of IBM 3278 and asynchronous communications access methods. "If a new technology comes along, we can just move to that," according to Ralph Kent, a programmer/analyst.

The electronic messaging system on the Integrated Workstation uses a mailbox that resides on the host mainframe. To send a message to another micro on the network, the user types the destination or destinations and sends the message to the mainframe.

Electronic mail can include data or text or a combination such as a spreadsheet, template or completed document. "Once I've got that up to the mainframe, we'll have a mainframe application to move it to all other locations," Savage said. The micro link has negated the need to buy a separate messaging system, he added.

CW Photo by P. Olin

Imperial Oil Ltd. programmer/analysts Ralph Kent (left) and John Savage wrote the routines for the Integrated Workstation.

The arrangement affords strict control at the data base administration level. "The file drawer and the file cabinet are resident on the mainframe and everything is backed up on tape, so the user always has access to a copy or even a copy of a file from a week ago," Savage said.

Strong Hopes for Integrated Workstation

TORONTO — The prototype Integrated Workstation recently developed at Imperial Oil Ltd. here is the first link in what developers hope will be a chain of microcomputers that can be used to program and test on the mainframe, exchange code between programmers and perform micro-based analysis using files extracted directly from the corporate data base.

The project team expects to introduce general downloading capabilities on a limited basis this fall. Using utilities contained in Tempus-Link, a microcomputer-mainframe link developed by Micro Tempus, Inc. of Montreal, and file transfer routines written by the project team, users will be able to extract Vsam data base files and load them onto "virtual disks." Those are mainframe-resident extensions of the disk drives contained in the IBM Personal Computer.

The mainframe can then perform the translation routines to enable the Personal Computer users to download the files. "We're using the big blue box for what it's good for, which is data manipulation," said John Savage, a senior programmer/analyst on the project.

The capability will enable users to run their application programs on the micro using the most current corporate information. Because the virtual disks are located on the mainframe, files can be updated by the data base administrator without requiring the user to perform another extract.

The integrated Workstation will also employ a tool management facility that is divided into sections colloquially called a tool box and a tool shed. The tool box will contain specific applications products, such as an engineering drafting program, which the user can retrieve at his convenience. The tool shed will include a broader range of applications administered at the data center level, retrievable by designated users.

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Not All Terminal Gear Detariffed, AT&T Contends

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission's (FCC) Second Computer Inquiry Decision detariffed only some — not all — terminal equipment, AT&T argued earlier this month in comments filed with the commission.

The comments mark the latest development in the phone company's continuing battle with specialized carriers and independent terminal makers over who should supply interfaces to group and supergroop circuits. Groop circuits are analog transmission pipes that carry, 12 or 60 voice-grade circuits; supergroup circuits carry 56K or 230K bit/sec of data.

Last January, the FCC ordered AT&T to eliminate restrictions barring private-line users and specialized carriers from leasing group/supergroup channels. The commission also told the phone company to explain why it must be the sole provider of group/supergroup modems, often referred to as network channel terminating equipment (NCTE).

AT&T and Competitors

The latter order precipitated a protracted argument between AT&T and its competitors, chiefly IBM and the Independent Data Communications Manufacturers Association, which represents the nation's major modem makers. AT&T's opponents, in earlier comments, have contended that:

- The Second Computer Inquiry decision deregulated all customer premises equipment (CPE) — as in terminal devices at the user's site.
- The FCC has classified digital channel interfaces as CPE for reasons that apply equally to analog wideband channel interfaces.
- Even though NCTE may need some adjustment and fine-tuning to work on a particular channel, this requirement can and is being accommodated by independent suppliers. "Equipment for terminating non-AT&T group and supergroup services is now commercially available from several vendors," IBM pointed out, adding that manufacturers of modems used with Type 3002 data channels similarly "design their equipment to adjust and compensate automatically for variations in the parameters that fluctuate within a range."

In its latest comment, filed Aug. 19, AT&T:

- Argued that not all terminal equipment installed on customer's premises was detariffed by the Computer Decision II.

Only CPE, which is "a severable commodity from the provision of transmission service," was detariffed, the company argued, quoting the decision.

- Insisted that the "amplification and equalization" functions performed by non-Bell modems and other channel interfaces are "associated only with the functions performed by that equipment." The "amplification and equalization functions required to provide analog services, on the other hand, are performed by AT&T-furnished equipment."

AT&T's key point was that regardless of where this latter equipment is located — in the network or on the customer's premises — it is not CPE because it is not "severable from provision of transmission service."

- Said the FCC, in the digital channel interface decision (Docket 81-216), added an exception to its conclusion that independent manufacturers are free to supply NCTE.

The exception: Where sufficient variability exists in the technical parameters of local-access channels, the FCC ruled, "supply of NCTE by the carrier" could "create a stable interface."

According to the phone company, the variability of local distributioo facilities connected to group/supergroup channels justifies invoking this exception.

IDCMA to FCC: Southern Bell Should Explain Interface Policy

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The Independent Data Communications Manufacturers Association (IDCMA), which represents the nation's major modem makers, told the Federal Communications Commission (FCC) last week that it should require Southern Bell Telephone Co. to explain why interfaces to its Local-Area Data Transport (LADT) service have to be supplied exclusively by a telephone carrier.

LADT is another front in the rapidly escalating war over channel interfaces. The service is a recently developed technology allowing standard analog local loops to carry digital data simultaneously at 4,800 bit/sec or alternately at 56K bit/sec.

Southern Bell's LADT service, the first in the nation, is now available in the Miami area. Its first customer is Viewtron Corp. of America, which plans to begin operating the nation's first large-scale videotex service next month in collaboration with AT&T.

First LADT

The battle over Southern Bell's LADT service began earlier this year, when the company filed its tariff for the first LADT service. It was accepted by the Florida Public Service Commission.

In June, shortly after the tariff's approval, IBM asked the FCC to declare the new system an "enhanced" offering under the Second Computer Inquiry.

Since then, a number of comments have been submitted by Southern Bell, several other Bell operating companies, AT&T, several terminal manufacturers and other common carriers. As with other aspects of the channel interface battle, this one revolves around the question of whether the LADT interface — AT&T calls it the Data Subscriber Line Carrier (DSLC) — is customer premises equipment.

According to Computer Decision II, AT&T and any Bell operating company that wants to provide customer premises equipment must do so through separate subsidiaries. That would prevent them from bundling LADT with on-line information services, such as videotex, into a package offered at a single price and make it easier for noncarriers, such as IBM, to offer competing services.

AT&T and the Bell operating companies argue that the DSLC is really a multiplexer which, according to Computer Decision II, is not customer premises equipment.

Similar But Different

IBM and the others who contest this claim agree the DSLC is a multiplexer, but maintain that the device performs other functions that make it quite similar to the digital channel service unit/network channel terminating equipment the commission has explicitly classified as customer premises equipment in a related proceeding (see story on Page 9).

In the comment submitted to the commission last week, IDCMA said that "at the least, the commission should require Southern Bell to identify the precise functions which the DSLC performs, describe how such functions differ from those performed by . . . network channel terminating equipment and demonstrate with particularity why each function in the DSLC must be under carrier ownership and control."

IDCMA also suggested that since "multiplexers today are routinely provided by independent [noncarrier] suppliers directly to customers . . . the commission should rule that [such] multiplexers will be treated as customer premises equipment."

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ICCP Acknowledges Lack Of Certification Resources

(Continued from Page 1)

General: a certification directed toward the broad areas within the computing and information systems profession.

Entry Level: a certification directed toward personnel entering the computing and information systems profession.

'Strategic Assessment'

The ICCP is writing a series of position papers, according to Robert Campbell, the organization's president, as part of a "strategic assessment" of the organization stemming from "a great deal of misrepresentation by critics as well as proponents.

"People say our exams are too basic and that they're only multipie choice," Campbell said. "They fault us for not having recertification or other certification programs. We thought it essential to clarify our position."

After a great deal of analysis, Campbell said, ICCP "went back to the very basics and developed a lifecycle model of the certification program and tried to define the architecture for the body of knowledge in data processing. We've gone through and analyzed the difference between some type of certification program for someone who is within his first three years in the profession vs. a certification for someone who has been in the profession 25 years."

Considering the relatively small number of DP professionals who hold a CDP — 26,000, or an estimated 1% to 3% of the data processing profession — Campbell concedes that ICCP operates "in a seller's market.

"People don't need a certification to get a job," Campbell said. "For the most part, people do it as an act of individual professional commitment more than anything else."

The Data Entry Management Association (Dema) recently started administering its own test for a Certificate in Data Entry. The Dema exam takes 90 minutes to complete and covers documentation, motivation, programming, training, scheduling and control.

FCC Delays Interim Standards

Channel Interface Battle Takes New Twist

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The war between telephone carriers and terminal suppliers over digital channel interfaces took a new twist last week when the telephone carriers won a tactical victory.

The Federal Communications Commission (FCC) delayed from this month until next October the adoption of interim technical standards that would permit the terminal makers to supply the interfaces linking user terminals to wideband digital access. The interfaces are generally referred to as channel service units and network channel terminating equipment (NCTE).

The nub of the dispute is whether telephone carriers should be the exclusive suppliers of these interfaces [CW, Aug. 1]. The issue is important because channel service units and NCTE interconnect users with all of the high bit-rate transmission services being offered by AT&T and the Bell operating companies. Moreover, it is widely believed that NCTE is certain to become the interface to domestic and international integrated services digital networks.

Key Point

For users, the key point is that if NCTE/channel service units are available from more than one source, price and performance are likely to be better than if a single source obtains a monopoly. This, at least, was the expectation of the FCC last June when it ruled that channel service units and NCTE are terminal equipment and thus, under the Second Computer Inquiry decision, can be supplied by manufacturers unaffiliated with a telephone company.

There is "no technical, legal, or policy justification for restricting independent manufacturers from providing [channel service units] or digital NCTE," the commission said in June.

The Bell operating companies, however, asked for reconsideration. Their original request came from five of the seven regional holding companies that will take over the majority of the divested operating companies after next Jan. 1.

The Bell operating companies' petition argued that telephone operating companies should be exclusive suppliers of the interface. A few weeks after that petition was filed, American Information Technology (Ameritech) — the holding company for the Illinois, Indiana, Michigan, Ohio and Wisconsin Bell Telephone Companies — submitted a second petition for reconsideration.

Ameritech's petition, however, puts forward a slightly different argument. Ameritech wants the telephone carriers not to be the exclusive supplier of channel service units/NCTE, but rather among the suppliers.

Ameritech's language could prove significant. A major argument of the first petition for reconsideration is that telephone companies have to be the exclusive suppliers of channel service units/NCTE because of the need to meet individual requirements. That cannot be done, according to the Bell operating companies, if the interface is supplied by a vendor other than the phone company.

However, the FCC rejected that argument in June, ruling that "it is not evident that there exist facility variations justifying ... an exclusively telephone company-provided interface." Ameritech's subsequent petition for reconsideration, while it alluded to this argument, stresses another one: "The commission, in its effort to expand the range of choices for channel terminating services ... may have inadvertently withdrawn an existing option." Ameritech "believes customers should have as one of their options [Bell operating companies] provision of NCTE functions."

Industry observers believe that if the FCC buys this latter argument, it may be opening a Pandora's box. Under the Second Computer Inquiry decision, terminal equipment — generally referred to as customer premises equipment (CPE) — can be supplied by AT&T and its operating companies only through separate subsidiaries. The FCC has decided that channel service units and NCTE are CPE. According to the settlement of the U.S. vs. AT&T antitrust case, however, the definition of CPE explicitly excludes "equipment used to ... terminate access lines."

Thus, if the FCC allows Bell operating companies to offer channel service units/NCTE competitively with independent vendors, it will almost certainly have to reconsider whether that equipment is CPE.

If the answer to that question is yes, the commissioners will be disagreeing with Federal District Court Judge Harold Greene.

If the answer to the question is no, the commissioners will be weakening the separate subsidiary rule and opening the door to further waivers that may obliterate completely the line between basic and enhanced services.

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Snet, CSX Planning 'Condo-Type' Fiber-Optic

By Phil Hirsch
CW Washington Bureau

NEW HAVEN, Conn. — Southern New England Telephone Co. (Snet) last week announced plans to build a "condominium-type" fiber-optic transmission network throughout the southeastern U.S.

The announcement is believed to be the first of several forthcoming from the company, which include:

- Developing a digital electronic message service scheduled to go on the air by the end of this year.
- Adding high-speed digital local loops to its telephone network.
- Planning to market a personal computer.
- Testing a local-area network.
- Going into the cellular radio business.

Snet's metamorphosis from a provider of telephone service to a vendor of on-line, computer-based information services may be a portent of what the 22 soon-to-be-divested Bell operating companies will do after they split off from AT&T next Jan. 1.

Because Snet is not being divested (while Snet is a Bell operating company, AT&T does hold a minority interest in it), it does not have to reorganize; Snet was, therefore, able to start developing enhanced products and services last Jan. 1 as a result of the Federal Communications Commission's Second Computer Inquiry decision.

The fiber-optic network announced last week by Snet, dubbed Lightnet, will be built in cooperation with CSX, Inc. CSX was formed in 1980 with the merger of the Chesapeake & Ohio and the Seaboard Coast Line railroads.

Lightnet will traverse 20 states east of the Mississippi River, covering an area bound roughly by the river and a line drawn between Philadelphia and Chicago. The Lightnet cable will be placed in the CSX railroad right-of-way.

Prospective Lightnet customers are communications carriers, government agencies, business firms and institutions with large amounts of data to transmit.

Lightnet's channels will be sold rather than leased under a variety of purchase plans providing users with tax benefits as well as operational economies, according to a press release issued by the partners.

Among the latter are investment tax and depreciation credits, a Snet spokesman explained. He added that a user, as an owner rather than a lessee, can control its transmission costs more effectively than if it leases communications channels.

MCI Channels

CSX is also allowing MCI Communications Corp. to build a fiber-optic communications network alongside its tracks. The MCI channels, however, will be leased rather than sold.

Lightnet is expected to be fully operational by the end of 1985. Construction is scheduled to begin this fall in Florida; by next spring, the Snet spokesman said, it is anticipated that Lightnet will interconnect Miami, Orlando, Jacksonville and Tampa, Fla.

A single-mode optical fiber, initially carrying 90M bit/sec, will comprise the Lightnet transmission pipe.

More Services Eyed by Snet

NEW HAVEN, Conn. — The first major move that Southern New England Telephone Co. (Snet) made to exploit the emerging market for smart network services occurred last Jan. 1, when the gate was opened by the Federal Communications Commission's Second Computer Inquiry. On that date, Snet established a new division, Sonecor Systems, to market terminals and smart network services.

Two months later, Snet purchased a 40% interest in Digital Termination Systems, Inc. (DTSI), one of some 50 companies the FCC has licensed to offer digital electronic message services (Dems).

The fiber-optic network announced last week by Snet is only one of several new transmission offerings the company is developing:

- By the end of this year, a fiber-optic trunk will be completed within Snet's service territory between Stamford and Hartford, Conn. Next year it will be extended up through New Haven to interconnect with the New England Telephone Co. near the Massachusetts border.
- According to Frank Wollensack, Snet's vice-president for technical planning, high bit-rate end-to-end services will be introduced by Snet next year. One candidate is a packetized offering similar to AT&T's Basic Packet-Switching Service; Bell Northern Research Co. is studying this idea and is scheduled to report next month, Wollensack said. Video teleconferencing is another likely service, he added.
- The Dems that Snet is building in collaboration with DTSI will employ microwave-based local distribution facilities that can be linked to satellite and/or terrestrial intercity facilities. The network is planned ultimately to stretch across the country and link 99 cities. Commercial service is expected to begin by the end of this year, Wollensack said.

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Network

be increased to 432M bit/sec, according to Frank Wollensack, Snet's vice-president for technical planning. One pair of glass fibers, each the diameter of a human hair, will then be able to carry more than 6,000 two-way voice conversations or the data equivalent.

After the system is fully operational, Wollensack maintained, wave division multiplexing will be added. This multiplexing technology enables a single fiber pair to transmit five laser beams simultaneously, providing 32,000 two-way voice conversations.

"At 432M bit/sec, Lightnet will be able to transmit the entire text of a 30-volume encyclopedia within one second," Wollensack reported.

Cincinnati Bell Forms Arm To Sell 'Professional Services'

Southern New England Telephone Co. is one of two Bell operating companies which will not be divested by AT&T next January. The other is Cincinnati Bell Telephone Co., which earlies this month formed a new subsidiary to "produce and market computer software, applications programs, computer processing and professional services," according to a press release.

Prospective customers of Cincinnati Bell Information Systems, Inc. include "the telecommunications industry worldwide as well as business users." Hospitals, universities and public agencies were mentioned.

The "professional services" to be marketed by Cincinnati Bell Information Systems include on-line systems consultation, design, implementation and conversion; training; and computer center operation and management. The company also plans to offer a time-sharing service.

Cincinnati Bell has already persuaded the British telecommunications administration to test a Customer Records Information System it developed in-house. This is one of several software packages the company expects to convert into products suitable for general business use.

In addition, a Cincinnati Bell spokesman said, discussions are under way with an unnamed university on the establishment of a computer-based telephone directory service.

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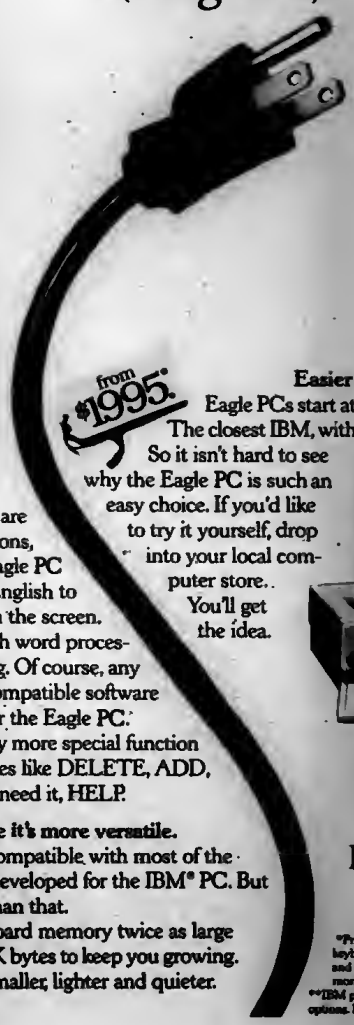

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**IBM price for basic system, serial port and parallel port options. MSRP published price information, June, 1983.

Tentative Pact Expected to Put AT&T on Track

By Peter Bartolik
CW Staff

NEW YORK — The Bell telephone system should be back to normal early this week as a result of the tentative settlement reached last week, an AT&T spokesman said here Thursday.

"It won't take more than a day or two" for normalization of operations, Phil DeLong said. Installation backlogs, he added, should dwindle rapidly as returning workers go on overtime to catch up. No estimate on projected overtime costs was available.

The only impact on system customers and Bell-dependent companies during the three-week strike — which involved members of the Communications Workers of America (CWA), International Brotherhood of Electrical Workers (IBEW) and Telecommunications International Union — was a delay in the installation of new telephone lines.

A CWA spokesman said the tentative contract agreement did not formally address the issue of how future negotiations will be conducted when the AT&T divestiture results in seven independent regional operating companies and an independent, slimmed-down AT&T core organization.

Work Resumption Delayed

Although the tentative settlement was reached Aug. 21 after 16 days of the strike, work resumption was delayed as the negotiation focus shifted to the local operating company level. Discussions with some 130 union locals were slated on issues such as working conditions and schedules.

A handful of locals had not settled by press time but were actively engaged in negotiations. CWA leaders set a deadline of 11:59 p.m. Aug. 24 for resolution of the local issues at 34 bargaining units around the country.

Among the five CWA locals that had still not settled by Thursday morning was the union at AT&T Long Lines in New York. The IBEW deadline was 11:59 p.m. Aug. 23, and that deadline was also missed by some locals.

Contract Agreement Costs

The contract agreements, which still must be ratified by mail vote of union memberships, will reportedly cost AT&T and the soon-to-be-formed seven operating companies in excess of $3 billion over the life of the contract.

Estimates of the strike settlement's impact on phone rates have varied, but the presently structured operating companies are said to have about $7.2 billion in hike requests already pending before various regulatory agencies.

Job security in the face of technological advancements was also a major union concern, and the contract reportedly will establish a company-funded training and retraining program. CWA spokesman Jeff Miller said no figure was specified in the contract, and details on funding and implementation will be developed by a labor-management committee.

M&D Eyes IMS, Non-IBM CPUs for Millennium

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — McCormack & Dodge Corp. (M&D) last week disclosed its intention to revise its Millennium line of application packages to operate with IBM's IMS and with processors other than IBM mainframes.

The Natick, Mass.-based software vendor also revealed plans to modify its Interactive PC Link option to interface with non-M&D data bases and to transmit mainframe records to microcomputers other than the IBM Personal Computer.

Both disclosures came from M&D President Frank Dodge during the first day of the company's sixth annual users group meeting, which ran from Aug. 22-24 and attracted an estimated 1,100 customers.

"We definitely will be releasing in the future IMS versions of our Millennium systems," Dodge said during his opening session remarks. "In addition, there are no technological barriers that we know of in going to other environments. So we are currently beginning a study of the feasibility of taking Millennium to minicomputer environments, which we expect to complete sometime in early 1984."

The proposed ability to operate in IMS host environments and to work with minis would significantly expand Millennium, which currently supports only IBM mainframes running the industry giant's CICS.

Introduced in July, Millennium embraces a set of on-line, real-time application packages that reside in an environment consisting of a data base management system, fourth-generation language, screen and forms generator and query facility. The Millennium environment also includes the optional PC Link capability, which allows users to download files from corporate mainframes, manipulate the records locally and then upload the information back to its source.

In its current form, PC Link can exchange data only between M&D data bases and IBM or IBM-compatible microcomputers. But in the future, M&D plans to extend PC Link to enable remote personal computer users to transfer files to and from either user-written programs or applications available from other vendors, Dodge said.

The software company also intends to expand the selection of personal computers to which the communications link can downline-load mainframe files, according to John Landry, M&D's senior vice-president of research and development.

PC Link, which will become available in volume shipments during the first quarter of next year, is still undergoing beta testing at American Hospital Supply Corp. in McGaw Park, Ill., Dodge said. In its initial release, PC Link will support local-mode 3278 and 3279 communications over coaxial cable, he added.

In other comments, Dodge clarified the availability dates for some of Millennium's constituent application packages, which will be enhanced versions of M&D's existing products. Some of the programs will include:

- Fixed Assets Version 6.0, which will become available in November.
- Accounts Payable Version 5.0, Purchase Order Version 2.0 and General Ledger Version 2.0, all of which will be ready for shipment in December.
- Human Resources Version 11.0, which is slated for first delivery during the second quarter of next year.

M&D to Target System/38

SAN FRANCISCO — The IBM System/38 is likely to be the first target of McCormack & Dodge Corp.'s (M&D) planned effort to migrate its Millennium application packages to the software firm's special products users.

That word came last week from Frank Orchard, M&D's Special Products Division manager, who spoke during the company's sixth annual users group meeting held here Aug. 22-24.

"The System/38 would be by far the most limiting [special products] environment" to which Millennium could realistically be extended," Orchard said. "If we can get Millennium up and running on the System/38, we can put it on anything."

At the other end of the ease-of-software-conversion spectrum are the Hewlett-Packard Co. 3000 series processors, which could accommodate M&D's latest family of application packages with few major problems, Orchard said. The HP 3000 series, one of eight mini- or mainframe-class processor lines covered by the software supplier's Special Products Division, will lend itself especially well to Millennium migration when it gains its first 32-bit machines, Orchard said.

The addition of 32-bit processors to the HP business systems line is expected to come in about 10 months.

If M&D fails in its ambitious bid to convert Millennium to CPUs other than large IBM systems, the company may have to acquire its special products software by buying it from competitors, Orchard said.

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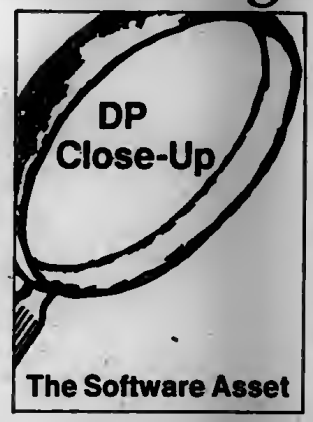
Among Both Users, Vendors

Concern for Guarding Software Mushrooms



By Jeffry Beeler
CW West Coast Bureau

Among users and vendors alike, concern for safeguarding and controlling proprietary programs has reached unprecedented proportions. Their concern stems from a growing industry awareness that software is no less a commodity than any other.

"Until recently, most companies regarded software primarily as an art or a science," said Dwight Olson, vice-president of San Diego-based Data Securities International, Inc., a third-party program maintenance firm. "But today, software is increasingly being thought of as an asset and, for the first time, is being treated accordingly."

The emerging recognition of software as an asset has prompted a growing number of companies — both users and vendors — to intensify their efforts to shield their proprietary programs from piracy and other unauthorized disclosures.

Probably one of the most conspicuous and far-reaching examples of the industry's increased software security-mindedness was IBM's announcement earlier this year of an asset protection policy. Under the policy, which was introduced with a minimum of fanfare, IBM imposed tight, new restrictions on customer and competitor access to the company's confidential source code.

Similar restrictions on source code availability have long been in place at NCR Corp. Although it occasionally makes exceptions in the case of applications programs, the company never releases the source code for its systems software, according to an NCR press spokesman.

In addition, about three years ago, the firm internally published a statement outlining NCR's policy on the protection of its intellectual property. Among other things, the statement reiterated the company's policy of licensing rather than selling or leasing its programs. It also specified the conditions under which customers can copy NCR-developed software. The NCR spokesman characterized the statement as more of a reaffirmation of the firm's existing software policy than a formulation of a new one.

Change in Users' Practice

Users, too, are increasingly making efforts to guard against breaches of sensitive program data. One such user is ITT, which reportedly has dropped its policy of requiring vendors to make available source code with all the programs that ITT acquires. That change in ITT's practice was reportedly adopted to minimize the company's legal exposure in the event that the confidentiality of its purchased software is someday compromised. Repeated attempts were made recently to clarify and confirm the existence of the new source code policy, but no knowledgeable ITT officials were immediately available for comment.

Evidence of mounting concern about program protection issues is by no means confined to recent shifts in corporate policymaking. The realization that proprietary code demands strict safeguards is also manifesting itself in an increased reliance on legal counseling and action.

"Not too long ago," recalled Susan Nycum, a partner in the law firm of Gaston Snow & Ely Bartlett in San Francisco, "when companies came to me for advice, they were usually concerned primarily with how to structure correctly their pricing. But now, one of the first things they always ask me is how they can protect their software."

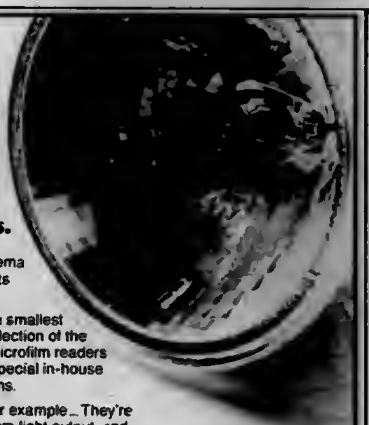
Nycum, who heads her company's high-tech arm, has noticed an increased client willingness to combat software piracy through litigation — a development she interprets as a sign of the industry's growing appreciation of programs as an asset.

She has also detected a distinct increase in the number of clients inquiring about software escrows. "I bet I get a call a week asking me if I know of a company that provides software escrow services," she said. "In the past, I never used to get those kinds of calls."

Many of the inquiries about software escrow services come from vendors who are becoming more reluctant to disclose their source code to the outside world and are allowing their programs to be released only in object form. Other inquiries, however, come from users who are insisting that their software suppliers' source code be entrusted to a mutually agreeable third party, where the material would be readily retrievable if the developer self-destructs.

One reason that companies are going to such elaborate lengths to safeguard their proprietary programs is

(Continued on Page 14)



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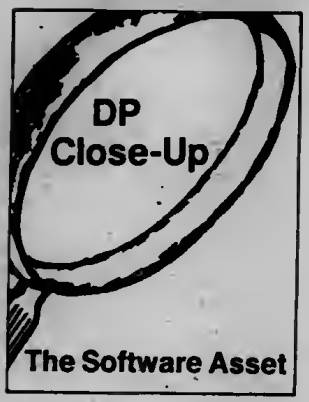
Issues for DP Chiefs: Legal Liability, Protection



By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Information systems chiefs are suffering a new set of management headaches as a result of the industry's growing recognition of software as an asset, according to lawyer Susan Nycum.

One headache is the increased risk of legal liability that systems managers now face if a proprietary program in their companies' possession is intentionally or accidentally disclosed, Nycum said during a recent interview.

Software's coming of age as an asset is also confronting information systems managers with at least one other challenge by helping to transform the face of their jobs, she added. Once concerned primarily with managing just computers, DP executives are now increasingly being called upon to oversee information.

As software's potential as a money-making commodity has steadily grown, so too has the realization by information systems managers that proprietary programs need to be carefully protected. "If a piece of [confidential] software belongs to your own company, you have to worry about what happens if it falls into another firm's hands," the attorney with Gaston Snow & Ely Bartlett said. "If you're licensing a program from someone else, you have to make sure your organization is adequately protected from the potential legal fallout" that could result if the confidentiality of the work is compromised.

Either way, proprietary code carries serious risks for the systems managers who are entrusted with safeguarding it.

The industry's emerging awareness of software's commercial value is also forcing management information systems executives to redefine radically the nature of their positions. Systems managers today are involved in a "whole different [occupational] ball game" from the one they were playing just a short time ago, Nycum explained. Until recently, they thought of themselves primarily as running a "closed shop." But now, their companies are increasingly calling on them to play the role of a corporate information broker.

For the first time, information systems managers are being required to meet the DP needs of "the people out there in userland who are operating their own [Apple Computer, Inc.] Apples and other personal computers," Nycum said. "They have to support those systems, and they have to be familiar with a whole bunch of software packages they didn't have to know about before." Nycum also foresees a continuing shift in user emphasis from hardware maintenance to software maintenance.

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Software Safety Becomes Priority

(Continued from Page 13)

that software is rapidly growing in importance as a source of revenue. Until recently, systems vendors derived almost all their income from hardware and let their customers have the necessary code for free. Today the old rules about systems revenues are slowly being reversed, with hardware increasingly becoming a giveaway item and programs accounting for a growing share of total vendor sales, Nycum explained.

At IBM, for example, revenues from software alone are believed to exceed $2.5 billion, Olson noted. With such enormous sums of money hanging in the balance, IBM and other vendors have a powerful incentive to keep their source code and other software products out of potential competitors' hands.

On the user side, the growing preoccupation with software security signals a shift in management information systems emphasis from hardware to information.

University Offers CAD/CAM Guide

ARLINGTON, Texas — The University of Texas at Arlington is offering a guide that compares a matrix of approximately 190 computer-aided design and manufacturing (CAD/CAM) system attributes with the features of more than 40 CAD/CAM system suppliers.

"CAD/CAM Presentation Resource Guide" includes a do-it-yourself checklist.

The guide costs $125 from the Office of Continuing Education, The University of Texas at Arlington, Arlington, Texas 76019.

Issues for Vendors: Source Code, Copyrights

By Jeffry Beeler
CW West Coast Bureau

The computer industry's growing tendency to regard software programs as an asset will spawn new kinds of software business practices, legal disputes and data protection measures, sources on both the East and West Coasts recently predicted.

As software revenues steadily rise and programs are increasingly viewed as just another commodity, vendors will feel a growing temptation to cease making their source code available to the outside world, Dwight Olson predicted. Olson is vice-president of Data Securities International, Inc., a San Diego-based software business services firm.

IBM has already tightened the internal guidelines governing access by customers and competitors to its source code. And, "as IBM goes, so goes the rest of the industry," Olson observed.

Concern about the security of proprietary source code could also result soon in important changes in the way software developers register their products for copyrights. On May 23, the U.S. Copyright Office in Washington, D.C., published in the Federal Register a Notice of Inquiry soliciting industry comments about current rules governing software copyright registration.

In particular, the notice asked whether existing registration procedures should be changed and whether the federal government should adopt new practices to provide special security safeguards for registered programs embodying trade secrets.

Copyright Office Protection

The request for comments came in response to expressions of growing industry concern about the security of programs left in the Copyright Office's protection. "Once a work is deposited with us for registration, it becomes part of the public record" and is readily accessible to anyone, including the developer's competitors, according to Mike Keplinger, head of the office's Information and Reference Division.

During the approximately three months since its publication, the Notice of Inquiry has drawn responses from "a number of industry organizations," many of which have expressed "a great deal of interest" in revising current copyright registration procedures, Keplinger said. The replies are now being reviewed by the Copyright Office, which has begun to reevaluate its software-related practices in anticipation of possible changes.

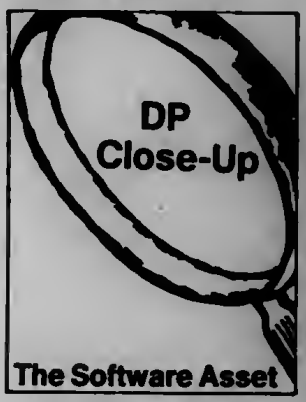
Two of the organizations that have responded to the request for comments are the Association of Data Processing Service Organizations, Inc. (Adapso) and the Computer and Business Equipment Manufacturers Association (Cbema). In their filings, both groups urged the Copyright Office to create a provision for secure deposits, which would allow vendors to register copyrighted software in a way that would shield the code from public disclosure.

"Adapso recognizes that the Copyright Office has a legitimate need to determine whether a program qualifies as a genuine work of authorship," said Ron Palenski, the organization's associate general counsel. "But we also hold the position that both copyright and trade-secret protection ought to exist for programs simultaneously."

The industry's motivation in proposing changes to existing copyright registration practices stems partly from concern about increasing foreign and domestic competition in the software field, according to Cbema's regulatory counsel, Ron Wheatley.

Other factors contributing to the widespread desire for improved software security include growing industry fear of piracy and counterfeiting and an emerging recognition by vendors that programs constitute a major source of new income. A third consequence of the industry's growing preoccupation with software security will be the advent of unprecedented legal wrangles between users and vendors, according to Susan Nycum of the San Francisco law firm of Gaston Snow & Ely Bartlett. As a case in point, Nycum cited a recent dispute in which a user became disenchanted with its outside software developer and demanded that the source code for its programs be transferred to a third party for safekeeping. But the developer balked at the suggestion for fear of possibly compromising highly valuable trade secrets.

"I foresee a lot more cases of this type arising in the future," Nycum predicted.



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FCC Issues Order; MCI Stock Drops

Datacomm Briefs

WASHINGTON, D.C. — The Federal Communications Commission (FCC) last week issued the full text of its revised access charge order [CW, Aug. 1], and MCI Communications Corp.'s stock dropped nearly .$5 a share.

By the time the slide was over, 16.5 million MCI shares — nearly 7% of the total outstanding shares — had changed hands, and the price of a share was down to $15.25.

The selling binge was caused apparently by the commission's statement in the text of the access charge order that MCI's access costs for certain local exchange circuits could rise from $234 to $500/mo.

However, MCI President V. Orville Wright said his company thinks the FCC's conclusion is "erroneous." Under the revised eccess charge decision, carriers would pay significantly more, and local exchange users would pay significantly less to support local telephone companies than was specified in the original access charge order, issued last December.

Whether the new plan will be implemented is very much in doubt at the moment. The plan is opposed by influential members of Congress, as well as U.S. Federal District Court Judge Harold Greene, who is presiding over the breakup of the Bell system called for by the settlement of the U.S. vs. AT&T antitrust case.

AT&T Asks FCC For Satellite OK

WASHINGTON, D.C. — AT&T has asked the Federal Communications Commission (FCC) to let it offer "specialized satellite services" — which include data transmission — on a "less regulated" basis.

Specifically, the company wants permission to file tariffs for specialized satellite services on shorter advance notice and without the extensive tariff-support material now required.

In e petition filed earlier this month, the telephone company ergued that "specialized satellite services are subject to a high degree of actual and potential competition . . . no firm can be considered to have market power or the ability to control facilities or price."

AT&T's petition is the latest development in e continuing inquiry known officially as Docket 79-252, launched in 1980, which is aimed at assessing the need for regulation of telecommunications carriers.

The primary result so fer: Resellers of dial-up telephone network services heve been largely deregulated.

AT&T pointed out in its recent petition that although the FCC has not yet eddressed the need for regulating satellite carriers in Docket 79-252, it has stated in a number of proceedings that the satellite market is now competitive.

Satellite Business Systems (SBS) has launched e campaign somewhat similar to AT&T's in an effort to get out from under restrictions imposed by the commission because of SBS' affiliation with IBM.

Banking Services Planned for Keyfax

CHICAGO — Videofinancial Services has signed an agreement with Keycom Electronic Publishing, headquartered here, to develop home banking services and financial transaction processing for financiel institutions participating in Keycom Electronic's Keyfax information service.

The service is to be introduced in the Chicago metropolitan area next April. Through the Videofinancial connection, Keyfax customers reportedly will be able to pay bills electronically, check their account balances and transfer funds between accounts.

Videofinancial Services is a joint venture of Banc One Corp., Columbus, Ohio; Southeest Banking Corp., Miami; Wachovia Corp., Winston-Salem, N.C.; and Security Pecific Corp., Los Angeles.

Keycom is a joint venture of Centel Corp., an independent telephone company; Honeywell, Inc. end Field Enterprises, publishers of the *Chicago Sun-Times*.

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Cox Battling to Designate Cable Net 'Interstate'

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — "Telephone company threats" along with state regulatory action inspired by telephone companies have already "severely restrained the development of cable [TV] broadband technology and services," Cox Cable Communications, Inc. told the Federal Communications Commission (FCC) earlier this month.

Cox asked the FCC last April to rule that its Commline data communications service in Omaha, Neb., is an interstate rather than intrastate offering. Commline bypasses the Omaha local-exchange network owned and operated by Northwestern Bell Telephone Co.

Cox acted after the Nebraska Public Service Commission (PSC) ordered the company to stop offering Commline until it obtains a common carrier license. The PSC action was triggered by a complaint from Northwestern Bell.

Cox persuaded the U.S. District Court in Omaha to stay the PSC order while it appealed to the FCC.

National Attention

National attention is focused on this battle because CATV potentially provides a route around most big-city telephone networks and an oppportunity to cut costs substantially for many business communications users. Furthermore, the FCC's resolution of Cox's petition will almost certainly impact the CATV regulatory legislation now pending in the U.S. House of Representatives.

Earlier this year, AT&T and state regulators tried but failed to add language to Senate bill S. 66, which would have subjected CATV-based data communications services to state regulation.

In its latest comment to the FCC, Cox reported that Pacific Northwest Bell Telephone Co. has told a Portland cable system operator, Rogers U.S. Cablesystems, Inc., that if it does not stop offering data communications services, Rogers will no longer be allowed to hang its cable on the telephone company's poles.

In New Mexico, Mountain States Telephone and Telegraph Co. has filed a complaint with the state utilities regulatory agency seeking to terminate an experimental data retrieval service offered by Albuquerque Cable Television, Inc.

In Omaha, meanwhile, Cox said it is being forced to pay $23,000 annually to lease cable conduit from Northwestern Bell. It was formerly charged less than $2,000/year. The increase was imposed shortly after Cox asked the FCC to declare Commline an interstate service.

"These attempts to restrain cable services come at a time when the industry is just beginning to fulfill its promise of meeting long-standing national policy objectives," Cox told the FCC. "The vast potential of its broadband capacity makes cable . . . a vital . . . end link to interstate service . . . Federal-preemption is urgently needed to avoid the . . . denial to customers of innovative broadband services."

Led by AT&T, the carriers have insisted that CATV-based communications services that compete with telephone company-provided offerings must be regulated in the same way.

However, Cox, in its recent atatement to the commission, insisted that the two are not substitutable with each other. It contended that Bell operating companies, in numerous filings with the commission, have recognized that local telephone networks are "suitable for analog voice transmission, but inadequate to carry computer data at high speeds."

Even if cable did represent a threat, the carriers allegedly would have little to worry about, according to Cox, which said Northwestern Bell earned $13 million from private-line services in 1981, which represented less than 1% of the company's total operating revenues.

"By comparison," Cox told the FCC, "Commline's market research optimistically hopes for $2.5 million in gross revenues by the fifth year of its operation."

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International Report

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AUSTRALIA

SYDNEY — Australia's first installation of Elxsi International's 6400, a scientific multiprocessor system, appears imminent following recent visits by top-level company representatives including Elxsi's president, Joe Rizzi. Rizzi claimed the system is expandable from 4 million instructions per second (Mips) to 40 Mips and yields two to four times the performance of Digital Equipment Corp.'s VAX-11 superminis; an entry-level system is reportedly priced at $500,000. Elxsi, based in San Jose, Calif., recently delivered its first three systems to two test sites in the U.S. and one in Singapore, sources said, adding that the firm is gearing up for the official U.S. launching of its product line at the end of this month.

DENMARK

COPENHAGEN — The staff of the Danish Savings Banks do not like their new Olivetti TP2 computer systems. The bank's order was said to be the largest to date in the Danish DP industry, valued at $5 million and consists of 5,000 terminals and 1,300 computers, spanning some 1,300 savings banks. Danish bank employees have complained about the system's slow response time and the long delivery terms of the contract. The installation of the systems is scheduled to be completed in 1985.

COPENHAGEN — The new Danish credit card, Dankort, is reportedly ready for use in shops and banks across the country. One million Danes have already received their cards from their banks, who introduced the card to reduce the number of paper checks. However, shopkeepers are not anxious to implement Dankort because they have to cover some of the transaction costs. The card was originally intended as a high-tech solution for on-line retail sales, but has evolved into a more traditional credit card.

JAPAN

TOKYO — IBM watchers here predict that a machine called Hercules, the Japanese counterpart of IBM's rumored low-cost Peanut microcomputer, will be available to the home market by year's end.

TOKYO — According to 25 Japanese small business computer manufacturers, their 1982 shipments increased a modest 30%, compared to rates of 50% that they had been enjoying over the past five years. A recent survey conducted by the Japan Electronic Industry Development Association found that the small business computer industry shipped 65,321 ayatems valued at over $1 billion during fiscal year 1982. Thirty-seven percent of these aystems consisted of very small configurations valued at under $13,600. This same segment showed the healthiest 1982 growth rate.

TOKYO — Hitachi Zosen Information Systems Co. Ltd. has introduced a microprocessor-driven desktop system for two-dimensional computer-aided design. Grade/Mini is a conversational system using tablet-menu method for data entry. Its hardware is composed of a 16-bit microprocessor, 768K bytes of random-access memory, a hard disk, floppy disk drive, CRT, pen plotter and tablet. It costs $30,000.

WEST GERMANY

STUTTGART — Even before the first models of the IBM 3084 Model Group Q have arrived here, there has been some speculation about the capabilities of the recently released high-end mainframe. Because there is neither a test site in Europe nor has IBM supplied specifics on the machine's performance, industry analysts believe that IBM might be having problems with its "Quadro Concept" and are cautioning users against making hasty decisions to buy, sources claimed.

Data Base Meet Set for Oct. 17

MAITLAND, Fla. — The Institute for Technology Integration (ITI) has announced that its First Annual Conference on Administration and Control of Data Bases will be held Oct. 17-19 at the Marriott Twin Bridges Hotel in Washington, D.C.

The conference will cover topics dealing with planning, implementing and using and administering data bases. Specific sessions will cover organizational reporting, enterprise modeling, distributed environments, logical data base design, data base management and telecommunications.

Other sessions will cover the direction of data administration, the impact of enterprise modeling, management and technical issues.

Registration costs $575 before Sept. 15 and $650 after Sept. 15. Additional registrationa from the same company cost $475 each. ITI can be reached through P.O. Box 778, Maitland, Fla. 32751.

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Denver, CO	October 4
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Claims They Upset Federal Balance of Power

Senator Requests Study of Computer Use Effects

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A U.S. Senate committee chairman has requested a congressional study to determine whether computers are upsetting the balance of powers between the legislative and executive branches of government.

In a letter sent this month to the Office of Technology Assessment (OTA), Sen. William V. Roth Jr. (R-Del.), chairman of the Senate Governmental Affairs Committee, said that increasingly sophisticated uses of computers by federal agencies may be making it difficult for Congress to oversee the activities of the executive departments and agencies.

"I believe a study by OTA of the ways in which computer systems can be used to expand or alter the functions of executive branch agencies would be extremely helpful to Congress in effectively carrying out its vital oversight functions," Roth wrote.

'Subtle But Significant Changes'

Roth explained that agencies may be updating existing systems through "subtle but significant changes," that may change the use of those systems "in ways not intended by Congress." He specifically mentioned systems used by the Federal Bureau of Investigation and the Transportation Department.

Referring to the FBI's National Crime Information Center (NCIC), which recently instituted a new computer file to help the Secret Service keep track of persons that might pose a danger to government officials, Roth said the NCIC system, "which began as a simple electronic 'bulletin board' of wanted fugitives, has reportedly been converted into a nationwide system for monitoring the whereabouts of persons thought to be 'of interest' to the government."

The Transportation Department's National Driver Register, which Roth said "was established to act as a 'clearinghouse' for information to help state and local licensing officials stay current on applicants' out-of-state offenses, has been 'updated' in a manner which could give the federal government control over the exchange of information between and among state and local licensing authorities."

Because these types of changes can sometimes be made with little additional funds, Roth suggested congressional oversight may be lacking. Thus, he said, these changes "can lead to substantial alterations in agency functions that may take place without the knowledge, let alone consent, of responsible congressional committees — not to mention Congress as a whole."

The Senate Governmental Affairs Committee has been active in the last two years in looking into federal computer use, particularly as it relates to issues of privacy and security. Charles Osolin, an aide to Roth, said the OTA study was requested because "we are looking for some basic information" on the effects of growing governmental technology.

Dr. Fred Weingarten, OTA Communication and Information Technologies Program manager, said in a telephone interview last week that given the complexities of the issues raised by Roth, it could take at least several months for the OTA staff to prepare a proposal for consideration by the agency's board, which decides whether to approve study requests. Six senators and six congressmen, evenly split among Democrats and Republicans, make up the board.

Of Roth's concern, Weingarten said, "I personally think it's a very important question." He added the OTA staff has been thinking about related issues for some time and noted that a recently approved study of office automation, to begin in October, will address similar topics, including "how information automation changes the function of an office."

BDPA Meet Set For Sept. 22-25

NEWARK, N.J. — Clarence Pendleton, chairman of the U.S. Civil Rights Commission, will deliver the keynote address at the fifth annual Black Data Processing Associates (BDPA) National Convention. The conference will be held here at the Hilton Gateway Hotel Sept. 22-25.

Pendleton has in the past stressed the need for increased black participation in high-technology fields. Newark Mayor Kenneth A. Gibson will deliver the welcoming address.

Workshops scheduled during the convention include sessions on careers, personal computing, "Impact of Computers on the Black Community," trends and "Technical Perspectives in Microcomputing."

Cost of attendance is $80 for members and $85 for nonmembers. Further information is available from BDPA National Convention, through P.O. Box 7466, Philadelphia, Pa. 19101.

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Nasa's TDRS Paves Way for Satellite Linkup

By Jim Bartimo
CW Staff

WASHINGTON, D.C. — When the Tracking and Data Relay Satellite (TDRS) successfully communicated with the crippled *Landsat 4* earth resources satellite in space recently, it paved the way for commercial satellites to communicate in space in the future.

The TDRS satellite was put into orbit this year by the National Aeronautics and Space Administration (Nasa) to receive data transmission from Nasa's satellites and apace shuttle [CW, April 18]. Received by the satellite at speeds up to 300M bit/sec, the data is sent to a single earth station in White Sands, N.M.

This marks a change from the way data has generally been sent back to earth, explained Laurancesic Goodman, project support manager for the Goddard Space Flight Center here. Satellites had to send data to one of several earth stations when the spacecraft passed over them in geosynchronous orbit.

"The object is to use a communications satellite that will act as a transmitter in space," Goodman said. "Other satellites will not need the on-board capability to dump [their data] to an earth station."

The advantages to Nasa of the TDRS are many. One is that future missions requiring immediate and interactive transmission of data to and from the satellite will be made possible. Examples of these missions are the shuttle's space telescope and the European Space Agency's Spacelab scheduled to go up on the next few shuttle missions later this year, Goodman said.

If commercial satellite companies plan to adopt this technology, they will have to launch their own transmitter satellites because Nasa's is only for scientific use. "We develop technology that eventually gets turned over to industry," Goodman said.

The future advantages to business of a transmitter satellite are more subtle, according to Malcolm McMullen, assistant vice-president for business development at the Space Communications Co. that developed TDRS for Nasa. "It has implications for international applications such as transmissions to China," he said.

With one transmitter satellite over each hemisphere of the world, data will be able to travel in apace without the currently neccesary stops on the earth. This will increase both quality and the apeed at which data is received from space.

Another benefit for satellite users may be reduced cost. "Nasa is going to save money," McMullen said, "because they've eliminated the need for about 15 ground stations and can use the one in White Sands."

Most satellite experts agree that this technology is years away. This type of satellite "has a potential use, but I don't think the need or practicality is here today," according to a senior vice-president of the satellite company M/A-COM Digital Communications Corp. in Rockville, Md. But Gene Cacciammani voiced the belief that the technology might develop in the future.

Leonard Kleinrock, professor of computer science at the University of California at Los Angeles and president of Technology Transfer Institute of Santa Monica, Calif., warned of competing long-haul communications technologies. "Fiber optics will provide the competition to satellites for the long-haul, wideband communications in the future," he said.

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Sita Net a Nerve Center of Airline Industry

By Katherine Hafner
CW Staff

PARIS — Imagine this: a worldwide communications network that slices through the tangle of standards and protocols to reach some of the most remote parts of the globe, while maintaining a typical transmission rate of 9,600 bit/sec and an average response time of 2.5 seconds.

Sita — a French acronym that translates roughly as "airlines' worldwide telecommunications and information services" — is, in short, the hub of the airline universe. Owned cooperatively by 248 airlines around the world and wielding an annual budget of some $128 million, Sita was founded in 1949 as a joint venture among a few European airlines for teletypewriter communications between Amsterdam and Paris.

Today, Sita coordinates telecommunications for its members from nine major centers placed in strategic locations to serve 950 cities in 154 countries. Utilizing both satellites and cable, Sita's data communications facilities are used for every facet of the airline industry, from on-line reservations to baggage tracing.

Sita's fundamental objective is to provide both large and small airlines around the world with access to its on-line data banks. Depending on the size of the member airline, Sita can either act as the airline's sole network source or work in conjunction with an airline's private network when communica-

(Continued on Page 22)

Sita Network Branching Out

Having established itself as a comprehensive network for communications among the world's airlines in the course of its 35-year existence, Sita has branched out to include such services as baggage tracing, meteorological services and personnel training.

Approximately 70% of the data communications traveling via satellite and cable over the Sita network is related to reservation information, according to Deszo Andorka, a Sita engineer.

Gabriel, Sita's real-time reservation system, serves 31 of the 248 member airlines. Based in Atlanta — even though Sita is headquartered in Paris — Gabriel is used mostly by small and medium-size airlines that need immediate reservation information, Andorka said.

Bagtrac, a baggage tracing service, and Bahamas, a baggage handling and management system, are offered jointly by Sita and the International Air Transport Association (Iata). Also based in Atlanta, Bagtrac and Bahamas are based on a Sperry Corp. 1100 system. The systems contain information about lost and found baggage. Bahamas stores information about lost or found luggage for up to three years, Andorka said.

Considering that Sita maintains an enormous bank of weather information, it makes sense that the organization should provide a meteorological service. Sita members can pay a fixed monthly fee for weather forecasts throughout the world.

In 1981, Sita technicians spent 35,000 hours training personnel to operate and repair such data communications equipment as modems, multiplexers, line controllers and hardware monitor tools, according to Andorka.

Based in Paris, the training center maintains branches in Amsterdam, Netherlands; Frankfurt, West Germany; Hong Kong; London; Madrid, Spain; New York; Rio de Janeiro, Brazil; and Zurich, Switzerland.

Sita also offers shared air cargo services, a shared aeronautical data base and a fare quote and tariff reference system.

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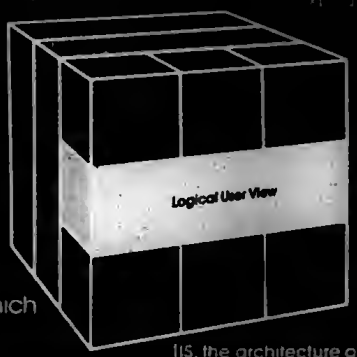

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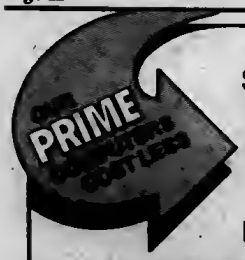

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Sita: Nerve Center of the Airlines

(Continued from Page 21)

tion demands reach beyond the network's capabilities.

A nonprofit organization, Sita charges each member airline an annual percentage based on its use of the network. Of the $128 million spent on the network each year, about $40 million is spent on circuits alone and $20 million on capital improvements.

The organization maintains 181 switching centers, 11,500 teleprinter terminals and 10,400 CRT terminals for reservations. Response time from the system averages 2.5 seconds.

The largest airlines belonging to Sita include KLM, Lufthansa, British Airways and Air France. Though these airlines all maintain their own extensive communications network covering Europe, the U.S. and other high-density traffic areas, situations calling for the use of a broader network are inevitable.

Some U.S. airlines use Sita — notably Trans World Airlines and Pan American World Airways — but most rely mainly on their own networks. In addition, those that fly to Europe generally fly to the larger cities rather than the remote points in which Sita specializes.

"All airlines in one form or another connect with areas where they don't have much traffic or where they have to interconnect with other airlines," explained Dezso Andorka, an engineer who helped design the Sita network. "That's when they turn to Sita."

Approximately 70% of the data sent through Sita is passenger reservation information. The rest includes marketing and statistical data, as well as administrative information. Sita's data base is also used for other applications offered as separate services to Sita members (story on Page 21).

"We have a fantastic volume of information not directly related to our communications services, but all the support activity that goes with those services," Andorka said.

Widespread Operation

Sita headquarters is located here in Paris, and the operation is spread around nine cities: London; New York City; Madrid, Spain; Paris; Amsterdam, Netherlands; Frankfurt, West Germany; Tokyo, Hong Kong and Rome. In each of these cities resides a mainframe — either a Sperry Corp. 418 Model 2 or a Phillips N.A. DS 714, all with automatic rerouting capability.

Each high-level center, which costs between $5 million and $7 million to set up, has four functions: switching, network control, storing and interface support for automatic routing and message assurance. All information is retained in the CPU's internal memory until positive acknowledgment of a transmission is received, then the information is erased.

According to Andorka, Sita is moving toward a "modular concept" for additional functions to be handled by each center. The Sperry machines will be phased out completely and replaced by smaller machines with more flexibility by 1985.

Sita is holding a conference in New York City Sept. 13-14 for its North and Central America members. More information is available from Sita's New York office, Suite 3118, 31st Floor, 500 Fifth Ave., New York, N.Y. 10110.

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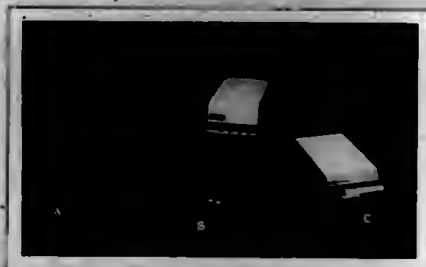

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E. VA212PAR — Auto Dial Modem Card
Racal-Vadic's newest 212 is an auto calling/auto answer Bell 212A-compatible computer-site modem card. It features a built-in tone or pulse automatic dialer. Because all circuitry is mounted on a single PC board, sixteen VA212PAR's will fit in Racal-Vadic's VA1680/81 rack-mount chassis.

F. VA3467 — Answer Only Triple Modem Card
The VA3467 is an answer-only direct-connect triple modem card. It automatically changes into a Racal-Vadic VA3400, Bell 212A, or 103, depending on which remote modem is calling. Using a VA3467 at the central computer site lets operators communicate with all popular low- and medium-speed modems. Eight VA3467 cards fit in a VA1680/81 rack-mount chassis.

G. VA3481 — Originate/Answer Triple Modem Card
The VA3481 is an auto calling/auto answer direct-connect triple modem. It can determine if the remote calling modem is a VA3400, 212A or 103, then configure itself accordingly. It's compatible with Racal-Vadic's VA811 Single/Multiline Automatic Calling Unit. Eight VA3481 modems fit in a VA1680/81 rack-mount chassis.

H. VA1680/81 — Multiple Data Set Chassis
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RACAL

'Uncle Sam Wants You,' Mass. Women Told

By Peter Bartolik
CW Staff

WASHINGTON, D.C. — While the U.S. Marines searched for a "few good men," the nation's Selective Service system wanted a few good Massachusetts women.

Or so it seemed this summer when warning letters began arriving at the Bay State homes of 1,000 or so 18-year-old females, advising them to march on down to U.S. post offices and sign draft registration cards.

In reality, according to Selective Service officials, there was a problem with the data Massachusetts provided from which draft registration compliance is determined by the Selective Service's IBM 3081 mainframe.

Massachusetts, according to Selective Service spokeswoman Joan Lamb, is the only state that provided magnetic tapes of driver's license registration data without distinguishing the sex of the licensee. The commonwealth "was the only place we have had a problem with," according to David Cox, assistant director for information systems with the service.

Since the reinstitution of draft registration in 1980, for men only, the computerized Selective Service system has registered almost 11 million males and claims a compliance rate of 98.7%. Operator lists from the 50 states provide the largest source of information for determination of registration, Lamb said recently.

Cox estimated that warning notices, printed on a Sperry Corp. laser printer, were mailed this year to approximately 1,000 Massachusetts women, perhaps as many as 1,500. The computer had initially been programmed to compare incoming lists with 400 female names — taken, according to Cox, "from a baby book" — and throw out matches. That wasn't adequate, and the list of names was boosted to 1,000.

Problems still arose, however, with names like Pat, Leslie and Kelly. "There's an awful lot [of such names] up there in Massachusetts," Lamb said, noting the "inventiveness" employed in spelling names. She said the computer was programmed to reject Candace and Kandace, but not Candyce and other variations.

Even so, Lamb said, "even to women it's not much of an inconvenience" to inform the department of their gender. Cox said it had always been realized some female names would slip through the screening program and some letters would be mailed to women.

Contrary to reports in western Massachusetts newspapers, Lamb said, Massachusetts men will not be able to evade detection of nonregistration merely by foregoing drivers' licenses. The computer scans lists from the Social Security Administration, U.S. Department of Defense and a variety of other lists including commercial mailing lists. Besides, Cox said, Massachusetts officials have agreed to identify gender on their data tape in the future.

Dema Meeting Set for Oct. 17

SAN DIEGO — "Commitment to Quality" will be the theme of the Data Entry Management Association's (Dema) seventh annual conference to be held here Oct. 17-19.

The keynote speaker for the conference is William G. Moore Jr., president and chief executive officer of Recognition Equipment, Inc., who will address the effect of new technologies on the careers of data entry professionals.

In-depth sessions will cover subjects ranging from the selection and evaluation of equipment to the Japanese style of management. Conference attendees will also have the opportunity to prepare for and take the Certification Program in Data Management (CDM) exam.

Registration for the conference is $398 for Dema members and $454 for nonmembers. A $35 certification fee will be charged for the CDM exam.

More information is available from Dema through P.O. Box 3231, Stamford, Conn. 06905.

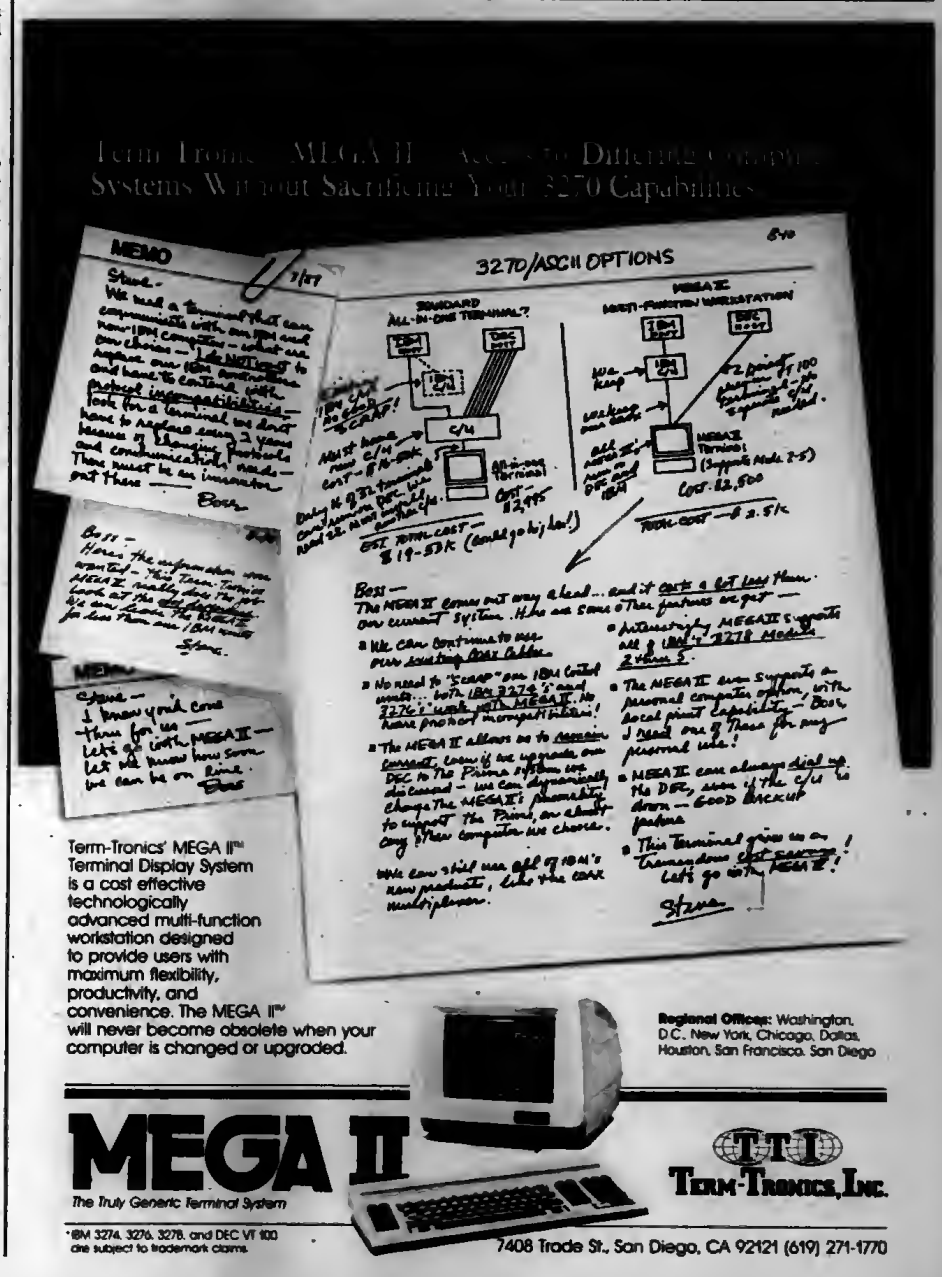
Chicago to Host Voice I/O Forum

CHICAGO — The third annual Voice Data Entry Systems Applications Conference, cosponsored by the American Voice Input/Output Society (Avios) and Abbott Laboratories, will be held here Sept. 27-29.

The purpose of the conference is to provide a forum for technical papers addressing the latest technology, research and applications pertaining to automatic speech recognition and voice synthesis.

Topics to be discussed at the conference will include human factors associated with voice I/O; telecommunications; applied research; and applications for manufacturing operations, medical facilities, the military and quality-control systems.

Conference registration fee is $200, which includes a year's membership in the society. The fee for workshops is $75. More information is available from Avios through P.O. Box 11, 307A, Palo Alto, Calif. 94306.



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Productivity Gains Up to 500%

Report Writer Saves Data Center Time, Staff

RICHMOND, Va. — A report writer and utility has proven to be both a time and manpower saver for a county government data center here, resulting in programmer productivity gains of up to 500% in the development of new batch report programs.

Henrico County's data center, manned by a staff of 22 programmer/analysts and another 31 data entry and control personnel, operates three Sperry Corp. 90/40 mainframe computers in support of all service agencies — from school administration to social services and public safety — in this second most populated county in the state.

One computer runs 24 hours a day providing computer-aided dispatch for the Public Safety Department; the second computer supports other administrative departments for 10 hours a day, and the third is used for developing systems programming part time, with both used at night for batch processing, according to William C. Haynes, project management supervisor.

"With the cost of computer equipment coming down and programmer costs rising," Haynes recalled recently, "our primary focus has been to increase the efficiency and output of our staff." The county's limited budget prohibits hiring additional analysts/programmers, so "it was critical we make use of programming tools to increase the productivity of our present staff," he added.

'Falling Further Behind'

In spite of budgetary restrictions, the agency users began to demand more data processing services. "It seemed as if we were falling further behind each day in meeting our users' needs," Haynes said, adding that small projects or one-time-only requests were often rejected because of the backlog in major projects.

Four years ago, the county searched for productivity tools. It saw a demonstration of Quikjob, a report writer/utility available through System Support Software, Inc. in Dayton, Ohio. "We knew it would save programming time, but we were concerned it would be rejected and not used by our Cobol-trained analyst/programmers because it was a new language," said Haynes.

Quikjob was brought in on a trial basis. "Our programmers took to it right away because Quikjob proved to be easier and faster to use than Cobol," Haynes said. While Quikjob is becoming the dominant language, he added, it is so similar to Cobol that programmers retain their skills in that language.

Quikjob's basic function is to construct and execute programs for reports, utility functions, file manipulation and data retrieval.

Less Than a Day

With Cobol, small project requests that were accepted usually took a week or more to complete. "This was an unsatisfactory situation," according to Haynes, but he said few requests are now turned away, and reports are produced in less than a day.

Quikjob's report writer can produce a report using 15 to 20 lines of code, in about one-fifth the time required with Cobol, according to Haynes. Other features include a programming language; an application tool "permitting nonprogrammers to write small report programs"; a development utility that creates, changes and dumps records; a debugging tool; and a compile and go facility "which can dynamically change the source code during the run," Haynes said.

It has been so widely accepted by the staff that all future batch reporting programs will be written using Quikjob, according to Haynes.

It also has some tangible benefits for nonprogrammer end users, he said. Using Quikjob, the center developed a program that lets the user extract and manipulate raw data. After they determine the exact requirements needed, the user can insert the major routines and variables and compile the program automatically, developing their own tailored reports without tying up the programming staff.

Aisp's Proceedings Spotlight Syntopican

WILLOW GROVE, Pa. — The 1983 edition of "Papers and Proceedings," featuring presentations from Syntopican XI, is now available from the Association of Information Systems Professionals (Aisp), formerly known as the International Information/Word Processing Association.

A total of 32 papers are offered in four categories: integrated systems technology; training and productivity; planning issues; and developing information systems. Syntopican speakers' biographies are also provided.

The 610-page, soft-cover "Papers and Proceedings" costs $30, plus $3 for postage and handling, and is available from Aisp, located at 1015 N. York Road, Willow Grove, Pa. 19090.

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- Life insurance applications and design experience would be strong pluses.

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Send your resume to EDS even if your particular experience and qualifications do not appear here. New contracts throughout the U.S. mean that new opportunities are being created every day.

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Four Displaywriters from IBM don't add up to one OIS 50 from Wang.

A Wang OIS 50 office information system with four workstations can do a lot more than four IBM Displaywriters.

For a lot less money.

Why? Because all four OIS 50 users access and share information, all at the same time.

While the four IBM machines can't. So they really aren't a system at all.

And the Wang OIS 50 can grow from one workstation to four workstations on the same system. While to add to your Displaywriter, you have to buy an entire new Displaywriter.

On an even more basic level, the Wang beats the IBM flat. Our standalone OIS 40 (which can be easily upgraded to a clustered OIS 50) can do far more than their standalone Displaywriter.

Ours has five times the maximum storage capacity theirs has. 10Mb for Wang, versus 2Mb for IBM.

Ours uses the same friendly word processing software as other Wang systems, while theirs uses word processing software that is unique to the Displaywriter, and incompatible with other IBM systems.

Ours has a superior selection of peripheral equipment, including versatile, letter-quality matrix printers, laser printers and more. And ours even takes up less work space.

All of which adds up to one obvious conclusion: the system that is four times better is the better system for these times.

For more information about the Wang OIS 40 and 50 office information systems, call 1-800-225-9264. Or write to Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851.

WANG

The Office Automation Computer People.

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CW2

Kennedy Center to Install $700,000 Computer System

WASHINGTON, D.C. — The John F. Kennedy Center for the Performing Arts has announced plans to install a $700,000 computer system to automate the center's accounting, payroll, marketing and fund-raising operations.

Digital Equipment Corp. has donated about $150,000 for the hardware, and American Digital Systems Corp. has donated $141,680 for the development of custom software applications.

The DEC equipment will include a VAX-11/750 superminicomputer with remote terminals, printers and word processing equipment, as well as a multifunction virtual memory operating system.

The center is using Basic, as well as DEC's high-level version of Cobol, according to a spokesman for the center.

The initial installation and implementation of the computer center will be to provide for the automation of the operations of the center's finance, marketing and development departments.

The second phase will provide for future box office automation, according to the spokesman.

The system is expected to be operational this fall, with all elements of the initial phase in place by early 1984.

Computer Measurement Group To Hold International Meet Dec. 6

PHOENIX — The Computer Measurement Group, Inc. (CMG) will hold its 1983 International Conference Dec. 6-9 at the Hyatt Regency Crystal City hotel in Arlington, Va. The conference will cover methods of performance evaluation.

Thirteen sessions will detail new techniques and case studies. Another 13 sessions will be devoted to management issues such as organizing capacity planning and performance management functions, management reporting, costing and how to integrate capacity planning with business planning, a spokeswoman said.

Nine introductory tutorials will present an overview of performance evaluation techniques and how to apply them. Advanced tutorials will address topics like network modeling, hardware leasing and cached direct-access storage device applications.

The keynote speaker will be George Roberts, director of the Advanced Technology Applications Division of Boeing Computer Services Co.

Registration for the meet costs $300 before Nov. 15, $340 after Nov. 14. More information is available from CMG, through P.O. Box 26063, Phoenix, Ariz. 85068.

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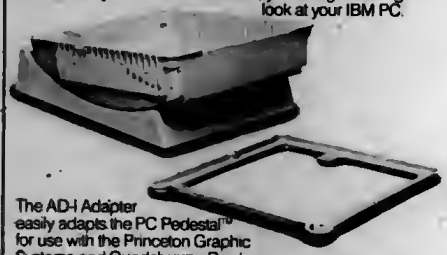

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Intech '83 DP Conference Announces Speaker Roster

WASHINGTON, D.C. — National Trade Productions, Inc. has rounded out the roster of speakers for its Intech '83 conference on communications and data processing, which will be held Oct. 31-Nov. 3 in Chicago's McCormick Place.

The keynote address will be delivered by Edmund Fitzgerald, president of Northern Telecom, Inc. Entitled "Business Integration — the Vision and the Reality," Fitzgerald's address will deal with the importance of communications in the future of integrated information systems, according to a conference spokesman.

For its Integration Theatre sessions, organizers have added Arnold M. Roberts of ADC Associates and Ed Horrell of Mitchell & Horrel, Inc. Roberts' speech is entitled "Selecting a Personal/Business Computer" and will include a how-to lesson. Horrel will offer a look at various benefits and drawbacks of using computerized branch exchange as the centerpiece of office automation.

Other additions to the agenda include William Moore, president of Recognition Equipment, Inc.; Dr. Eugene Cacciamani Sr., vice-president, M/A-COM DCC, Inc.; Russell Aldrich, Apple Computer, Inc.; and Susan Kay, Hannagan & Associates, Inc.

The three-day conference costs $395 with a $35 discount available to those who register early. More information can be obtained by writing Intech '83, 9418 Annapolis Road, Lanham, Md. 20706.

Ansi X12B Group Seeks Members, Lists Meetings

WASHINGTON, D.C. — The recently formed American National Standards Institute (Ansi) Committee X12B on Data Dictionary Maintenance and Implementation Guidelines is looking for additional members to ensure that all viewpoints are represented.

The committee is encouraging potential members to attend two meetings it has planned for Sept. 27-29 at the Royal York Hotel in Toronto and Nov. 15-17 at the Ramada Airport Inn in Tampa, Fla.

The committee hopes to produce documents that set guidelines on how information is formatted and transported as well as a dictionary based on the Ansi X12.3 and supplemented with information used by the transportation and grocery industry.

An X12B spokesman said potential members associated with any other industry that has produced a dictionary used in data exchange can submit it to the subcommittee.

More information about the committee can be obtained by writing to Tom Jones, Western Datacom, 5083 Market St., Youngstown, Ohio 44512.

Winter Meet Set On 'Recognology'

FORT LAUDERDALE, Fla. — The Recognition Technologies Users Association will hold its 1984 winter conference here Jan. 8-11.

"Cost Effective 'Recognology' in the Information Age" will be the theme of the conference, and the keynote speaker will be Edwin Sherin, senior vice-president of American Express Co. James F. Foley Jr., executive editor of the "Journal of Information Management," will be a luncheon speaker.

Registration for the conference is $280 for members and $350 for nonmembers. More information is available from the Recognition Technologies Users Association, through Box 2016, Manchester Center, Vt. 05255.

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Federal DP Conference To Feature DOD Brass

WASHINGTON, D.C. — U.S. Deputy Secretary of Defense W. Paul Thayer and Deputy Under Secretary Dr. Edith W Martin will be the featured speakers at a special three-day briefing on Mission Critical Computer Resources (MCCR) at the Federal Computer Conference, slated Sept. 13-15 at the Washington Convention Center here.

In their keynote addresses, opening and closing the program track, Thayer and Martin will focus on the Department of Defense's (DOD) new initiatives to improve the acquisition and management of computer resources critical to military or intelligence missions.

Other top-level DOD officials will provide in-depth briefings on the latest MCCR policies, as well as the computer-related research and development projects that promise to have a profound impact on weapons systems. In addition, industry leaders will report on the state-of-the-art technologies driving and defining the Nth-generation computer system.

Vico E. Henriques, president of the Computer Business and Manufacturers Association, will chair a special panel of industry leaders who will discuss applications of the latest technology in DOD programs with advice on managing change in today's highly dynamic technological environment.

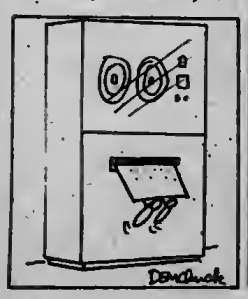
Other subjects to be addressed by the MCCR track include assessment of current DOD policy, computer-related R&D, DOD computer policy initiatives and life-cycle management in MCCR applications.

Exhibitors will include Bunker Ramo Corp., Burroughs Corp., Data General Corp., Digital Equipment Corp., Honeywell, Inc., IBM, Gould, Inc. and Wang Laboratories, Inc.

Registration fees for federal employees are as follows: $275 for all three days; $95 for Wednesday or Thursday, $180 for both days; $150 for Tuesday, a seminar day; and $235 for Tuesday and Wednesday or Thursday.

Fees for other registrants are: $350 for all three days; $115 for Wednesday or Thursday, $215 for both days; $180 for Tuesday alone; and $285 for Tuesday and Wednesday or Thursday.

More information can be obtained by writing to the Federal Computer Conference, P.O. Box 368, Wayland, Mass. 01778.



'Jedi' Developer to Speak at ACM Meet

NEW YORK — Edwin E. Catmull, director of the Computer Research and Development Division at Lucasfilm Ltd., will address the founder's luncheon of the Association for Computing Machinery's (ACM) Annual Conference here Oct. 26.

Catmull will speak on "Computer Graphics and the Future of Special Effects in Movies," and demonstrations of advanced computer techniques will accompany the presentation.

For more than 10 years he has been involved in the making of computer-generated movies, and his staff has developed computer-generated effects for films including *The Wrath of Khan* and *Return of the Jedi*.

The conference will be held Oct. 24-26 at the Sheraton Centre Hotel here and will feature presentations and panels on the latest in computer hardware and software development.

Prepaid attendance fees are $90 for members, $130 for nonmembers and $25 for students. More information is available from the conference coordinator, ACM, 11 W. 42nd St., New York, N.Y. 10036.

Apple's new Lisa® is the world's most powerful personal computer.

Its 32-bit MC68000 microprocessor gives it the processing capability of a mid-range mainframe.

It also has one million bytes of internal memory. And, with a 5-Megabyte hard disk, more than 15 times the on-line mass storage of standard microcomputers.

Given these most imposing credentials, one could get the impression Lisa was designed solely to scare one's socks off.

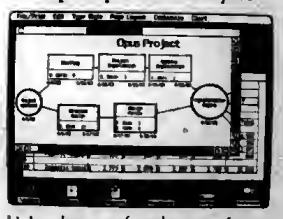
On the contrary.

What makes Lisa totally revolutionary is that, for the first time, all this phenomenal power is contained in a business computer you can learn to use in under 30 minutes.

200 years of hard work made it easy.

To tell Lisa what to do, all you have to do is point.

But achieving this simple concept required a totally new approach to software and 200 person-years of development.



Lisa's revolutionary software lets users perform several applications simultaneously, even "cut" and "paste" them together. The powerful project management program seen here is a Lisa exclusive.

Lisa replaces complex computer commands with symbols familiar to anyone who's ever worked at a desk.

Even someone who's never touched a computer before can learn Lisa in under half an hour. Versus the 20 hours or more required to unriddle conventional PCs.

To information managers, that means dramatically reduced training time and increased productivity.

But people don't just learn faster on Lisa, they also work faster. Each of Lisa's powerful applications* use symbols and commands common to all. So with little practice, users can move from LisaCalc to LisaGraph to LisaWrite without missing a beat. Or use them all at once, "cutting" information from one program and "pasting" it directly into another.

Weigh Stations Get a Lift With Minicomputer

Weighing tons of coal or pulp wood — important jobs for a Virginia coal mine and a Tennessee paper mill — can be done in seconds with the help of a small computer and an on-site workstation.

Both the Pittston Coal Group in Lebanon, Va., and the Hiwassee Land Co. in Calhoun, Tenn., use an IBM Series/1 minicomputer connected to truck scales to weigh coal or pulp wood delivered to their plants by independent suppliers.

Figures obtained at these computerized weigh stations help each company pay the suppliers for the material they deliver, providing them with computer-generated reports that eliminate a time-consuming and error-prone manual procedure.

Don Kettenbeil, assistant woods manager at Hiwassee, a division of Bowater North America Corp., said the computerized system has saved a full day's work each week for the company's bookkeepers.

And Ray Williams, Pittston's assistant vice-president for economic development, said the computer system "not only has eliminated all the overtime, but we now can weigh many more trucks because the reports can be done quicker."

Pittston has computerized weigh stations at 10 locations and will install five more at the 11 mining firms in Virginia, Kentucky and West Virginia that make up the coal group.

At the Clinchfield Coal Co., part of the Pittston group, the computer is used to help weigh about 26,000 tons of coal dumped there daily. Hiwassee receives deliveries from nearly 300 trucks carrying about 2,000 cords of wood every day.

At both Pittston and Hiwassee, a weigh station operator only needs to enter information through a keyboard that identifies the supplier and, as in the case with Hiwassee, the type of wood delivered.

Hiwassee receives 40% of its wood by truck. The remaining 60% comes from the company's rail and barge haulings in Tennessee, Georgia, Alabama and Kentucky. A similar computerized weigh station is installed at Hiwassee's scale house at Bowater Lumber Co.'s sawmill in Albertsville, Ala.

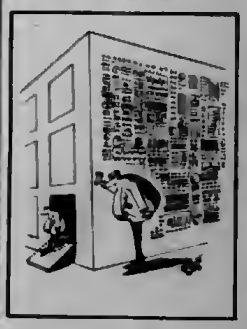
Through codes given by the operator, the computer produces a report that lists the tonnage, identifies the supplier and truck driver and notes the time of delivery, providing information used later in paying the supplier.

Coal suppliers are paid by the ton, and inaccurate daily measurements were costly, said Williams. Frequent overtime was required for operators to produce the reports manually, which added to the expense.

"We feel now we're getting the coal we're paying for. Before, we weren't so sure," added Max Bailes, group vice-president for Clinchfield Coal.

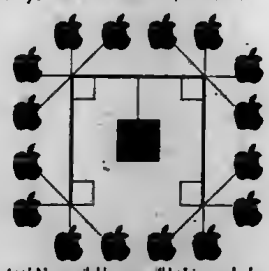
Kettenbeil said a truck carrying long wood — wood not yet cut into 5-ft, 3-in. bolts used in making newsprint — can be weighed and unloaded in less than 20 minutes. Contractors delivering wood have identification cards with holes punched in them. The cards identify the supplier for the computer. All the weigh station operator keys in on the workstation is the type of wood being delivered. The weighing procedure takes less than two minutes, he said.

"Generally, we have a standardized in and out time of about 15 minutes for trucks being unloaded in the wood yard," Kettenbeil said. Using the computer to reduce the time a driver spends at the scale eliminates bottlenecks at the scales, he said.



There's even a program — LisaProject — that lets you use the mouse to chart the progress of complex projects, automatically recalculating when deadlines or resources change.

On paper, Lisa is just as exceptional. With its dot matrix and daisy wheel printers, it produces printed materials just as you see them on the screen.



AppleNet, available soon, will let Lisas and other Apples share information, and costly peripherals

Powerful connections.

Any Lisa system can become part of a powerful Lisa network through AppleNet, our own low-cost local area network.

It will enable a user to transfer documents from one department to another, so they can be rapidly reviewed. Or modified. Or passed on to other Lisas.

The same network will allow Lisas to branch out to other Apples.* Or share disks, printers and other costly peripherals.

Using the LisaTerminal program, Lisas can tie into mini, mainframe and other personal computers by emulating VT 100-type terminals. Or, using the Apple Cluster Controller, it can also emulate 3270-type terminals.

In short, one Lisa can do the chores of many terminals. All of which means swifter response times and better distribution of resources.

Stay on top of new developments.

Lisa's unique user interface enables programmers to develop Lisa-style programs with unaccustomed speed.

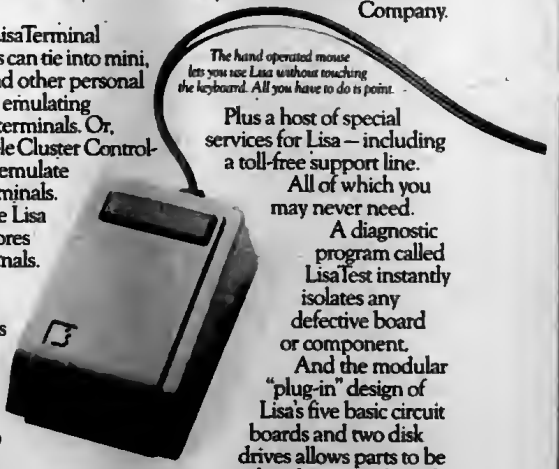
But that's not Lisa's only programming attraction.

The Lisa Workshop provides a powerful environment in which to develop COBOL applications. A full screen Lisa-like editor, code generator, and multiple windows make a visible difference in development times.

Apple will supply all the documentation, instruction, and support a developer will require to integrate applications into the Lisa environment — no matter how sophisticated their information processing needs.

We support the whole family.

Apple now offers nationwide on-site service for all Apples in conjunction with RCA Service Company.



The hand operated mouse lets you use Lisa without touching the keyboard. All you have to do is point.

Plus a host of special services for Lisa — including a toll-free support line.

All of which you may never need.

A diagnostic program called LisaTest instantly isolates any defective board or component.

And the modular "plug-in" design of Lisa's five basic circuit boards and two disk drives allows parts to be replaced in seconds, with just one tool: Your fingers.

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*With more programs on the way, Lisa's library now includes LisaCalc electronic spreadsheet, LisaList data base, LisaWrite word processing, LisaGraph business graphics, LisaDraw presentation graphics, LisaProject electronic project management and LisaTerminal data communications. For information regarding corporate purchases through our National Account Program, call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637. Or write to Apple Computer Inc., MIS/EDP Marketing Dept., 20525 Mariani Ave., Cupertino, CA 95014. ©1983 Apple Computer Inc.

Calendar

Week of Sept. 25

Sept. 26-30, Boston — **Systems Analysis and Design Workshop.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 26-30, San Francisco — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036

Sept. 26-30, Lake Tahoe, Nev. — **How to Develop an Effective Long-Range Data Processing Plan.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Sept. 26-30, Sunnyvale, Calif. — **Structured Analysis and System Specification Workshop for Microprocessors.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 26-30, Orlando, Fla. — **IDMS-DC Programming.** Contact: Mary M. Welcher, Harris Software Services, Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

Sept. 26-30, Louisville, Ky. — **Systems Analysis Workshop.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Sept. 26-30, New York — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held in San Francisco and Columbus, Ohio.

Sept. 26-30, New York — **C Language Programming Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Sept. 26-30, San Francisco — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 26-30, New York — **Structured Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011. Also being held in Boston.

Sept. 26-30, Chicago — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 27-28, Philadelphia — **Effective Presentations.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 27-29, Boston — **Data Communications Concepts and Systems.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 27-29, Chicago — **SAS Basic Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511

Sept. 27-29, Louisville, Ky. — **Compufest '83.** Contact: The Kentucky Society of Certified Public Accountants, 310 W. Liberty St., Louisville, Ky. 40202.

Sept. 27-29, Los Angeles — **Data Communications Network Design and Optimization.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 27-30, San Francisco — **Structured Requirements Definition.** Contact: Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

Sept. 27-30, Washington, D.C. — **Microprocessor Software, Hardware and Interfacing: A Hands-On Workshop.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held in San Diego.

Sept. 28-29, New York — **CICS/VS Testing and Debugging.** Contact: Data Base Management, Inc., 107S Tolland Tnpk., Manchester, Conn. 06040.

Sept. 28-30, Columbus, Ohio — **Data Base Management Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Sept. 28-30, New York — **Practical Data Security: Implementation and Management.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 28-30, New York — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Sept. 28-30, Seattle — **Data Analysis.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 28-30, Washington, D.C.— **Fundamentals of Data Processing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 28-30, Boston — **Software Quality Assurance.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Sept. 28-30, Honolulu — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Sept. 28-30, New York — **Project Management.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Sept. 28-30, Arlington, Texas — **Designing On-Line Systems.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Sept. 28-30, New York — **Localnet '83.** Contact: Lorraine Thelian, London Online, Inc., Suite 3314, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 28-30, Atlantic City, N.J. — **Hewlett-Packard Co. Users Eastern Regional Conference.** Contact: Pete

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Southern Systems Canada:
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Calendar

Somers, Cape Data, Cape May, N.J. 08204.

Sept. 28-30, Arlington, Va. — **SAS Basics Conrse.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Sept. 29-30, Pittsburgh, Pa. — **Innovative Systems, Inc. Annual Users Gronp Conference.** Contact: Innovative Systems, Inc., 341 Fourth Ave., Pittsburgh, Pa. 15222.

Sept. 29-30, Orlando, Fla. — **Simolatioo Systems Conference.** Contact: Technical Marketing Society of America Conference, Department 5IM, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

Sept. 29-30, Washington, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 29-30, San Francisco — **Local Area Networks: Selectioo Guides.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in New York.

Sept. 29-Oct. 1, Boston — **CP/M '83.** Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 26-Oct. 7, Parsippany, N.J. — **ANS Cobol.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07901.

Week of Oct. 2

Oct. 1, New York — **Word Processing on the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

Oct. 2-5, Tampa, Fla. — **The First Annual Ioternational High-Techoology Trade Fair.** Contact: Stephen A. Michelini, Staff Assistant, Mayor's International Trade Fair Committee, 1 City Hall Plaza, 8E, 306 E. Jackson Street, Tampa, Fla. 33602.

Oct. 3, Boston — **Low-Cost Cadd for Architects and Engineers.** Contact: Carol Gosselin, A/LE Systems Report, P.O. Box 11316, Newington, Conn. 06111. Also being held Oct. 5 in Chicago and Oct. 7 in Los Angeles.

Oct. 3-4, Worcester, Mass. — **Fundamentals of Data Processing For Management and Users.** Contact: Kathy Shaw, Office of Continuing Education/Higgins House, Worcester Polytechnic Institute, Worcester, Mass. 01609.

Oct. 3-4, Kansas City, Mo. — **Applying the New Tools for Profit and Cash Flow Planning: Graphics and Personal Computers.** Contact: Matthew Malok, The American Institute of Certified Public Accountants, 1211 Ave. of the Americas, New York, N.Y. 10036. Also being held Oct. 6-7 in Nashville, Tenn.; Oct. 11-12 in Hartford, Conn.; Oct. 24-25 in Dayton, Ohio; and Oct. 27-28 in Grantville, Pa.

Oct. 3-4, New York — **Electronic Mail.** Contact: Bob McKane, Techtran, 72 Cummings Point Road, Stamford, Conn. 06904.

Oct. 3-4, Washington, D.C. — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, New York — **Personal Computers: Programming in Basic.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, Columbus, Ohio — **Videotex: Implications for Marketing III Confereoce.** Contact: The Management Development Programs, College of Administrative Science, The Ohio State University, 220 W. 12th Ave., Columbus, Ohio 43210.

Oct. 3-5, Chicago — **Financial Ioformation Systems — Integrating Personal Computers.** Contact: Department PR, National Institute for Management Research (NIMR), NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Oct. 3-5, Chicago — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, San Jose, Calif. — **SNA Architecture and Implementation.** Contact: Communications Solutions, Inc., 992 Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Oct. 3-5, Washington, D.C. — **Data Base Management Systems For Micros and Minis.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, Englewood Cliffs, N.J. — **Capacity Management Forum.** Contact: The Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Oct. 3-5, Chicago — **Successful Use of Minicomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, Portland, Ore. — **Structured Design Seminar/Workshop.** Contact: Jane Crosswhite, Oberland Associates, 4036 N.E. Sandy Blvd., Portland, Ore. 97212.

Oct. 3-5, San Francisco — **Systems Analysis and Design: Basic Concepts and Effective Practice.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 3-5, New York — **Unix System Internals.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 3-5, San Francisco — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

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EDITORIAL

Wait for the Final Chapter

The latest round of ammunition has been fired in the fight over video display terminal safety. This time the focus has shifted to include the media, which is being blamed for manufacturing a controversy when none exists.

A recent study prepared by a panel of experts for the National Academy of Sciences at the behest of the National Institute of Occupational Safety and Health concluded that VDTs do not cause physiological harm to an operator's visual system. Moreover, "existing data do not provide a sufficient basis for establishing mandatory standards for display, lighting and workstation parameters" [CW, July 18].

The Niosh study, which was based on existing literature on the subject, went on to suggest that further research into the hazards posed by VDTs to vision and muscle fatigue is unwarranted.

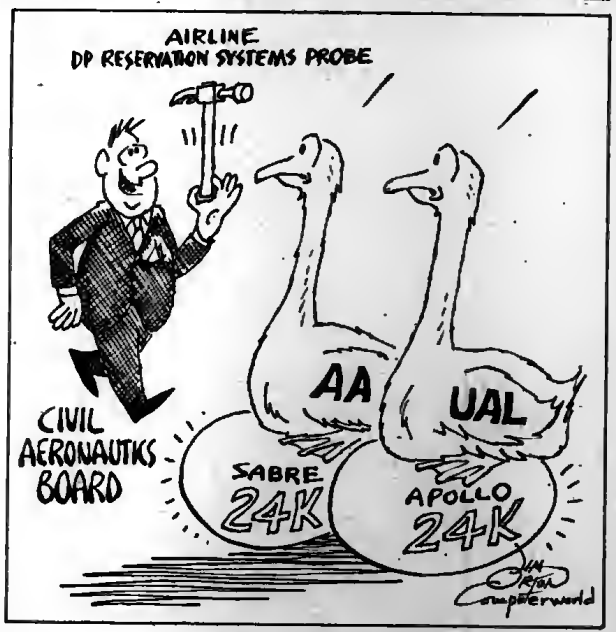
Enter Barry Johnson, director of Niosh's Biomedical and Behavior Science Division. Johnson agreed with the basic findings of the report, but took exception to the panel's implication that further research is unnecessary [CW, Aug. 22].

While accusing the media of blowing the whole mess out of proportion, Johnson pledged that Niosh would continue research into the possible ill effects of VDT use. As long as those who must stare at the glowing green phosphor for hours on end continue to have health-related complaints, Johnson said, it is Niosh's responsibility as a public agency to continue investigating the problem.

We applaud Niosh's persistence, in particular, the agency's incipient research into the adverse effects VDTs could have on a woman's reproductive system. Scheduled to begin sometime this fall, the Niosh study will examine a sampling of female VDT operators and how constant use of the terminals affects them. In light of continued reports of miscarriages among VDT operators, we consider this new Niosh study a timely piece of action.

Niosh is also embarking on an overall study of work-related health issues to include, but not restricted to, VDT use.

As long as the question remains open, we consider it the media's responsibility to cover the issue in full until the final chapter on VDT safety has been written. There is no telling how long that might take.



'I Just Want to Tap Them a Bit.'

DATA PAST

Five Years Ago
Aug. 28, 1978

SAN FRANCISCO — Four of the jurors in the Memorex Corp. vs. IBM antitrust trial stated in affidavits that presiding Judge Samuel Conti was biased in favor of IBM. Those affidavits, taken by Memorex attorneys after Conti issued a directed verdict in favor of IBM, also revealed that at one point the jury would have delivered a verdict in Memorex's favor except for an instruction from Conti that they believed prohibited them from compromising.

— — —

WALTHAM, Mass. — Cambridge Memories, Inc. joined the ranks of 370-compatible mainframe suppliers by announcing a family of three medium-scale processors.

Ten Years Ago
Aug. 22, 1973

WHITE PLAINS, N.Y. — IBM introduced a new data communications line discipline to benefit users with terminal equipment operating at 2K bit/sec or higher. Called Synchronous Data Link Control, the transmission format was restricted to operating with virtual mainframes and would not be compatible with IBM's then-standard Binary Synchronous Communications.

— — —

CUPERTINO, Calif. — A teenager with a fondness for computer fun and games, plus a clerical error, cost Tymshare Corp. $1,850 in computer time and a lot of embarrassment when the teen used his home computer to tie into Tymshare's system.

LETTERS

Pinpointing the Problem

I use a development CICS region to test new and modified applications programs.

Sometimes a program will go into a tight loop using storage and reading a file so that the operator must cancel the CICS region with a dump.

This problem can be prevented by adding two options to the program control table entry.

One option would place a limit on the number of accesses to files; another option would place a limit on the amount of core used.

A more general enhancement would be the printing of the formatted trace table (as is done with data extent blocks, data control blocks and so on) to pinpoint the problem more quickly.

Would other users agree?

R.A. Sobieraj
Perth Amboy, N.J.

Liberal Arts Graduates

Liberal arts graduates have long had the reputation of having their heads in the clouds and lacking so-called common sense.

Finally, someone has discovered that people who study liberal arts are educated and not merely programmed to program: This is evident from the article "Help Wanted: DP Execs Turn to Liberal Arts" [CW, July 11].

Communication, literacy and the ability to think are as necessary in data processing as is training in the mechanics of the field. These skills are acquired as a matter of course by liberal arts graduates.

A computer science degree has never been a certificate of aptitude or competence, yet liberal arts graduates who are self-taught in the arcane ways of computers have often been felt to be somehow inferior to a holder of the magic B.S. in computer science.

Perhaps now that liberal arts graduates have been eminently successful in data processing, this prejudice will end.

Richard H. Timberlake III
Colorado Springs, Colo.

Professional Books

Congratulations for publishing George Harrar's excellent In Depth article "The Computer Book Boom" [CW, July 18].

The well-researched, intriguing article provides glimpses of the exciting world of computer book writing and publishing.

I am an author, and the article was of special interest to me. It even opened my eyes to some of the opportunities I have been missing.

The computer book boom parallels the dramatic proliferation of microcomputers.

I suspect that most computer professionals still do not read professional books.

I hope Harrar's article will create interest among professionals, not only in reading computer books, but also in writing them.

The studying and sharing of knowledge may even help make a fortune.

Girish Parikh
Shetal Enterprises
Chicago, Ill.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

SOFTLINE /Werner L. Frank‡

Applications Portability for Microcomputers

The trade press has given wide support to the belief that the primary path to portability for microcomputer applications software is its implementation within the context of a specific operating system. Sometimes the more astute observer will also couple the need for a common implementation language as the necessary ingredient to transportability of computer programs from one machine environment to another. Thus, there are the so-called portable packages that follow behind the P-System with Pascal, Microsoft, Inc.'s MS-DOS with Basic and Digital Research, Inc.'s CP/M with its favorite language.

But there is another possible solution for achieving this objective, and it appears that this alternative is an unsung, little-heard-about activity buried in the less-read press.

I speak of the Institute of Electrical and Electronics Engineers (IEEE) Standards Committee's efforts to produce the Microcomputer Operating System Interface (Mosi) standard. The committee has appointed the Mosi Working Group, which has been busy for several years (under IEEE Task 855) to create what is currently designated as the Revision 6.0 proposal, Version 1.0. The document is a readable 100 pages that is now circulating for final vote by the Mosi Working Group in order to submit it for approval to the IEEE Standards Committee.

The objective of the effort is to create a programmable interface between a microprocessor-based application and a specific operating system associated with a target computer system.

'The Mosi standards' focus is, therefore, the applications program rather than the more traditional approach, which attempts standardization on the operating system itself and then imposes conditions on the application. That is to say, the concept imposes on the application itself the requirements for interface to the operating system. This is accomplished by defining and mechanizing a well-structured and selected set of servicing categories of capability modules. These capability modules are made up of basic functions that are, in turn, composed of fundamental operations related to system-controlled and system-managed resources.'

In that sense, it is not an operating system itself; nor is it an operating system standard or even specification.

Rather, as stated in the draft proposal, it has the goal of facilitating "the writing of portable application programs or systems [with which] a programmer should be able to write programs that, with little or no changes at the source level, may be run on a number of different computing systems, [that is] particular machines running particular operating systems."

Override Limitations

The techoology commonly known to accomplish this objective typically limits such portability to hardware with a common CPU chip and/or to a common operating system. But Mosi's objection is to override these limitations and be applicable across the board — that is, apply to any language, operating system or machine architecture. In particular, it should also readily adapt to the variety of already widespread, in-use operating systems and applications development languages.

The Mosi standards' focus is, therefore, the applications program rather than the more traditional approach, which attempts standardization on the operating system itself and then imposes conditions on the application. That is to say, the concept imposes on the application itself the requirements for interface to the operating system.

This is accomplished by defining and mechanizing a well-structured and selected set of servicing categories of capability modules. These capability modules are made up of basic functions that are, in turn, composed of fundamental operations related to system-controlled and system-managed resources.

The capability modules are:

- Memory management.
- Time management.
- Data transfer.
- Data management.
- Process management.
- Process synchronization and communications.
- Interface with the environment.
- Exception processing.

As long as the operating system supports these functions, the application adopting these services can execute in the associated environment.

Heart of the Standard

The heart of the standard is the definition of the basic functions or primitives from which the eight capability modules are built. In the current Version 1.0, there are around 75 such fundamental macros defining seven of the capability modules. Each function is proposed with specified format, including a list of input parameters, the list of function return items and the possible return code for messages or error conditions. The data management capability module is, however, not yet defined under the Mosi standard Version 1.0 in terms of these basic functions.

Within this general structure, the standard also defines levels of compliance, representing classes of operating systems that are possible by virtue of the presence of selected capability modules.

There are four such levels of compliance identified so far in the proposed standard:

- Real-time support (industrial control, real-time monitoring and laboratory automation).

(Continued on Page 34)

HUMAN CONNECTION /Jack Stone‡

Red Tape Snarls U.S. Drive for Modernization

"There are more than 19,000 computers and a [supporting] work force of 250,000 in the federal government, and [the computers] are, by and large, twice the age, both hardware and software, as those in the private sector. And they're obsolete. In fact, they're so obsolete that in some cases federal employees have to maintain the computers because the manufacturers have discontinued servicing them. That's how bad it is."

So proclaimed J. Peter Grace, chairman of the president's survey on cost control, in remarks quoted recently in *The Washington Times*, Aug. 16. Unfortunately, the topic was switched after these rousing words were printed, and an explanation of the reasons for this terrible situation was not immediately forthcoming. Only several thousand words later in the article did the reader receive a hint of the origin of the problem, the U.S. Congress.

Here's a case in point: More than a decade ago, a certain federal agency entered the era of the large-scale computer through the well-worn procedure of obtaining funding commitments, preparing a request for proposal (RFP), entertaining bids from the major vendors and selecting the lowest bidder that met specs. At the time, a second-generation machine was installed, and although users were reasonably satisfied, additional needs had to be answered and new equipment was justified.

Because systems were fairly stable at the time, and certainly simplistic when compared with today's renditions, it was not too difficult to spring loose several senior staffers to spend a few months on preparing the bid and evaluation offers. Third-generation equipment was soon wheeled in, plenty of conversion aids showed up and in relatively short order, the systems were back in operation, machines teeming with excess capacity to accommodate the users for at least seven years hence, the planners thought.

Running Out of DP Steam

As you can probably guess, this agency's machinery started running out of DP steam after only four short years. So the staff scrimped and saved and revamped all the programs to reduce processing time and release more resources to accommodate new and pressing systems. This exercise went on for many months, during which period the staff spent many of its waking hours assuaging users and trying to convince them that the DP operation was another unwitting victim of budgetary congressional constraints.

They pointed to the finance committees on Capitol Hill that refused to scratch up the dollars for a new system.

As is so often the case in the national legislative process of this great nation, many decisions of this nature are made on the basis of political compromise rather than objective merits of a particular project; as a consequence, many federal programs are, like the DP establishment, destined to operate in ways that promote gross inefficiency, incredibly high costs and great staff frustration.

After much time-consuming lobbying by agency officials, the Congress released the funding, and the DPers joyfully started in to prepare a new RFP. But in short order, they halted in their tracks when learning that procurement regulations for large computer "buys," implemented as derivatives from congressional mandates, were far more stringent and complicated than they had seen a decade before.

Top Talent

Some estimates suggested that just to prepare the RFP, the center would have to strip itself of its top talent for six months, not to mention the technical personnel required for support in such areas as:

- Evaluating technical proposals.
- Preparing fair benchmark tests.
- Negotiating with the vendors during benchmarking.
- Responding to congressional letters of complaint regarding alleged unfair treatment during the benchmarking from vendor/constituents.

So the center wisely gave up on the project and found some hardware hanging around to which to give temporary upgrades, pending policy change in DP procurement. Actually, they had little choice, because getting the RFP out the door was tantamount to dropping systems support of current operations.

Portability for Microcomputer Applications

(Continued from Page 33)

- Single development support (single executing process).
- Complex development support (multiprocessing support).
- Complete support (total support of all environments).

The Mosi standard is, of course, a generic approach to mechanizing the interface of the application to the operating system. It must be reduced to specificity in any one case of an application being matched with an operating system. This operates as follows: First, the abstracted, servicing capability modules with their associated basic functions are sufficiently defined to satisfy applications software needs and dependencies on the operating system.

An example of this is as follows: If the capability module is memory management, then the functions are:

- Allocate (obtains a specified amount of memory for use by the calling process).
- Get Allocation Unit (returns the size, in bytes, of smallest possible unit of memory allocation).
- Amount Remaining (provides amount of storage yet remaining).
- Free (returns a previously allocated block of memory to the free storage pool).
- Get Size (provides the size of a designated storage block).

Second, the specific language and operating system used to implement and execute the application needs to accommodate the specific standard interface calls as defined by each function for the varying capability modules.

This can be done in a number of ways, including using specific functions or defined procedures of a specified language that have a direct analog with the standard and having the operating system recognize and accept the Mosi function or its equivalents.

To Achieve Requirements

To achieve both of these requirements, the interface may be directly implemented or indirectly served via source transliteration during compilation or translation during the object code linking process.

The Mosi effort is an ongoing project. While the present standard is under final review, the committee has already identified additional areas that must be studied for standardizatioo and subsequent inclusion.

These areas are:

- Multispace memory management.
- Record locking 1/0.
- Multilevel error handling.
- Allocating shared memory.
- Exception handling in a multiprocessing environment.

Further information concerning this project can be obtained via Mosi Working Group Chairman Jack Cowan at Intel Corp. in Phoenix, Ariz.

Frank is an independent consultant and president of the Werner Frank Computer Group located in Calabasas, Calif.

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LETTERS

DP Lawyers

As a lawyer who has tried a DP case to a substantial judgment in favor of a disgruntled user, I am troubled by Charles P. Lecht's diatribe against lawyers in his article "DP Lawyers: Hessians of U.S. Tech Revolution" [CW, May 16].

Unquestionably, a lawyer must learn the underlying facts of his case to try it successfully. Ultimately, however, our society entrusts the resolution of disputes, no matter how arcane, to judges and juries with limited ability to grasp technical details. The lawyer's job is to communicate the facts on a fairly primitive level.

While I can imagine there are lawyers without any real background in DP who have commenced cases on behalf of disappointed users, I'd be surprised if there were many lawyers who brought such cases and then were unwilling to learn the facts of their cases as best they could.

In the rare case in which someone has brought a lawsuit that is completely without merit and done so out of malice, there is a remedy for malicious prosecution: Damages include attorneys fees paid out in defense of the original action. Punitive damages are also recoverable in many jurisdictions.

The experience with medical malpractice may be instructive. In the early '70s, physicians complained bitterly along the lines similar to those expressed by Lecht. Malpractice insurance premiums rose dramatically. Doctors lobbied for laws to protect them. Eventually, malpractice claims began to diminish. Some observers believe that the reason for the change is fundamental — physicians sensitized to malpractice exposure have become more careful and today there is less malpractice going on.

Perhaps something similar will happen in the DP industry. Vendors that have been burned by lawsuits arising from their past misrepresentations may be more cautious in the future.

Matthew P. Mitchell
Feldman, Waldman & Kline
San Francisco, Calif.

Or How to Have a Happy User

Ten Tips for the Frustrated MIS Manager

By Les Gilliam
Special to CW‡

Are you one of the multitude of information systems managers who is having problems with his users? Are you unable to get them to define accurately their needs, allow adequate time for development and have reasonable expectations of service? Are there cost overruns and projects behind schedule? Maybe it is time to consider these 10 steps to user satisfaction.

1. Operate data processing as a business. Functions should include research, engineering, manufacturing, marketing, delivery and maintenance, as well as billing and accounting.

A complete review should be conducted of how well your department is performing these functions. Have you determined what services you will and will not provide? Are you staffed and trained to be all things to all people in terms of computing? You may find it appropriate and necessary to document and publish your areas of responsibility and authority, pointing out the areas being delegated to the user.

2. Know your customers. To be successful, you must know your customers' business, their problems, needs and goals. Do you know their organization in great detail, the people and their authority and responsibility? Have you been successful in convincing them of your interest in solving their problems?

3. Assign responsibility. You need to assign an account representative or user coordinator for each customer department as needed. The person serves as your representative in dealing with customer management. The user coordinator is responsible for planning, managing and measuring the effectiveness of services to that user or group of users. Likewise, it is imperative that the user appoint a representative so that the joint responsibility is concentrated and the interdepartment communication is always clear and timely.

4. Educate for credibility. If your user is told it will take two years and several million dollars to build an office building, he will accept those estimates. But he may go through the roof when you give him your system development time and cost estimates. Most users know little about the system development cycle, recruiting and training, design and programming, data editing, data base costs, security, disaster recovery planning and other functions.

A concerted effort is needed to educate your user in his own terms to develop a feel for what is involved in DP and what are realistic requirements. Outside sources may be needed to provide factual accounts of the time and cost experiences other companies have had.

5. Plan jointly. The representative from information systems and the user group should conduct several in-depth planning sessions annually. At the first session, the

(Continued on Page 36)

Triangle JCLcheck Supports MVS/XA

SAN JOSE, Calif. — Triangle Software Co. has announced Release 4.1 of JCLcheck, its software utility, adding MVS/Extended Architecture (MVS/XA) support capability.

Running on any IBM or IBM-compatible mainframe under IBM's OS/VS or VM/CMS operating systems, JCLcheck detects and diagnoses JCL errors and run-time abends in a job stream before submission for test or production runs, the company said.

Operating under IBM TSO, Tone Software Corp.'s Tone series, Applied Data Research, Inc.'s Roscoe or IBM's CMS, JCLcheck reportedly provides complete documentation on a job stream or entire production system suitable for insertion in the run book.

JCLcheck licenses for $15,500; with MVS/XA support, it costs an additional $1,750. Triangle Software is located at Suite 108, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

Boole & Babbage Enhances IMF

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced Release 1.1 of its IMS Management Facilities (IMF), an integrated architecture of performance monitoring and management software tools for IBM's IMS data base management system.

The release features a Detail Trace command to the IMF work load analyzer component. Detail Trace gives the user on-line displays of each unique event in the flow of an IMS transaction. This reportedly simplifies troubleshooting of IMS problems. Release 1.1 also eliminates the high overhead involved with running IBM's Data Communications Monitor program and waiting for a batch report, according to the vendor.

The IMF architecture is comprised of nine IMS performance management products. IMF works in real-time and off-line to analyze, monitor, evaluate and manage current IMS system activity.

IMF operates under IMS Release 1.1.6 and above and is priced from $12,000. Boole & Babbage is located at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Executation Links Users' Micros To Data Center

FAIRFIELD, N.J. — Informatics General Corp. has introduced Executation, a remote processing service for business managers that links personal computers at user sites to Informatics' mainframe systems at a central data center.

Executation, currently compatible with the IBM Personal Computer, was designed to maintain and transfer files created by MDCR, Inc.'s Impact, a decision support software system; SAS Institute, Inc.'s SAS, a statistical analysis package; and Mathematica, Inc.'s Ramis II and Informatics' Inquire, which are fourth-generation data base management software systems.

Features of the Executation software include advanced error recovery, intelligent terminal emulation, bidirectional data file transfer and distribution of microcomputer software. Informatics said it plans to introduce Apple Computer, Inc. Apple II compatibility later this year, as well as data entry, graphics, word processing and electronic mail capabilities.

Terminal emulation capabilities enable the microcomputer to act like an intelli-

(Continued on Page 38)

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PE Enhances Reliance Plus, Offers File Entry System

OCEANPORT, N.J. — Perkin-Elmer Corp. has announced a new release of its Reliance Plus on-line transaction processing and relational data base management system (DBMS) for the line of PE 3200 systems. The company also introduced RUS/32, a file entry and update system that runs under Reliance Plus.

Reliance Plus reportedly includes a data dictionary, query/report processor and a complement of applications development facilities.

The relational DBMS component (DMS/32) provides an indexed file organization in which records are referenced by either one unique primary key or multiple nonunique secondary keys, a spokesman said.

A screen definition facility allows nonprogrammers to design screen forms. Screen forms and applications can be added or modified to Reliance Plus while in use without affecting the production environment. Consistent commands, function keys, case entry and abbreviated commands are available.

The RUS/32 query/report component now supports parameter substitution when running a saved query. A saved query contains information regarding the relationship of multiple data base files, what fields are to be displayed or printed, which records are to be selected based on qualifying criteria and printed report format specifications.

RUS/32 is said to access the same data base as Reliance Plus applications written in high-level languages.

The facility allows users with no programming knowledge to create, delete or modify records interactively, the spokesman said. Specifications are entered by filling in blank screen forms that have automatic prompting and Help facilities.

The price on the PE Model 3205 is $8,500 for the initial copy. Right of copy costs $3,800. For the Model 3210 and Model 3230, the initial copy costs $16,500, and the right of copy costs $6,400. For the 3250, 3250XP and 3200 MPS, the price is $24,500, and the right of copy costs $8,500. PE's Data Systems Group is located at 2 Crescent Place, Oceanport, N.J. 07757.

FD Translator Converts Cobol

NEW YORK — Information Builders, Inc. has announced the Cobol FD Translator to enable users of its Focus package to translate automatically Cobol File Descriptions (FD) into corresponding Focus or schema definitions.

Once the translator creates the Focus master, the file can be analyzed with the full range of focus facilities, which include ad hoc queries, formal reporting, graphics, statistical analyses and financial modeling, according to a spokesman for Information Builders. In addition to FD conversion, the translator produces an audit trail of hard-copy reports that document the conversion process.

The company said the translator's operation is controlled through a series of menu-driven screens that run under IBM's MVS/TSO or VM/CMS. The price of the Cobol FD Translator is $3,500, or $100 per month for rental from Information Builders, 1250 Broadway, New York, N.Y. 10001.

VAX Users Get Sort Package

ESCONDIDO, Calif. — Touch Technologies, Inc. has announced TTI Sort, a sort package for users of Digital Equipment Corp. VAX series processors using the VMS operating system.

The package reportedly decreases sorting time and space requirements by as much as half on VAX systems. In addition, the package uses up to 85% less direct I/O and almost no buffered I/O. The package also generates fewer page faults and uses 50% to 60% less disk space than DEC's sort/merge facility, the vendor said.

TTI Sort may be used as a standalone package or interfaced with the user's software. The package costs $1,295 for a perpetual license. Touch Technologies said from Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

Text Manager Fits Wang VS

SEATTLE — A new version of its documentation and text management system for Wang Laboratories, Inc. VS computers has been released by Barratt Edwards International Corp. (BEI).

Version 4.1 of Autodoc features faster operation, better screen prompts and improved word processing and text editing functions, a spokesman said. New capabilities reportedly include a calculator mode available while editing documents; enhanced column manipulation; sorting within a document; and scrolling within edit functions.

Autodoc is primarily designed for creating and maintaining program specifications, technical manuals, online user instructions and other in-house documentation, BEI said. It runs on any type of VS workstation.

The new version is priced at $4,000. Further information is available from BEI at Suite 204, 1836 Westlake North, Seattle, Wash. 98109.

Ten Tips for Frustrated MIS Managers

(Continued from Page 35)

users present their needs and desires, organized and arranged by priority. Several days are then allowed for the information systems people to estimate staff, time and cost requirements.

The users must realize that they, too, will have to devote people resources to all the projects envisioned, including lead times for recruiting, training and acquisition if the project requirements exceed current capacity. Ultimately, the users must commit funds to buying the services for the identified projects, and information systems must make a commitment to perform the services.

6. **Accept user leadership.** This is needed from both information systems and users. Teams must be assigned, schedules developed, milestones set, task lists written and work begun. A user or information systems representative may be the team leader, or co-leaders may be established. Team leader responsibilities include seeing that progress reports are prepared and management review sessions are conducted.

7. **Charge for services.** In most companies, the goal for internal computer charging is not to make a profit but simply to recover the costs. Users must have the option, within reason, to decide how much of the information systems services they will buy from year to year. Rates must be set for personnel time and machine time and adjusted periodically as needed. If a user pays for the system, he should then be the owner with all rights of ownership. This should greatly increase his commitment to the system development process.

8. **Report progress.** Written progress reports should be prepared at least monthly. Prepared by the team leader and distributed to all team members, information systems and user departments, the reports should compare progress against the original plan and schedule. Of particular note should be topics requiring face-to-face meeting by management of the two departments.

9. **Produce results.** Some projects can take months or years to develop, with the user paying but seeing no visible results. Your relationship with the user could be greatly enhanced if you took the time to develop some interim data gathering procedures, sort programs and simple reports.

10. **Request a critique.** If you seek the counsel of your user you will make a friend and establish a lasting relationship. If he seems reluctant to meet face-to-face, develop a questionnaire to be sent to all users and returned anonymously to your boss.

After you make the first move and tell the user why you want to be critiqued, in most cases the client will want you to reciprocate. Another possibility is that your boss can discuss it with the user's management and agree it is a good idea for both sides.

Don't resort to written memos only. Get to know each other as human beings and see the user's problem from his viewpoint.

Gillum is an independent consultant with over 25 years of experience in data processing. Based in Ponca City, Okla., he advises corporate and data processing management on computer and office resource selection and management.

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Accounts Payable System for HP 3000 Debuts

TULSA, Okla. — An accounts payable system for Hewlett-Packard Co. HP 3000 computers has been announced by HMS Computer Systems, Inc., formerly Hinderliter Management Systems.

The AIM/3000 Accounts Payable System is integrated with HMS' other AIM/3000 financial products for the HP 3000, the vendor said. In addition to managing cash disbursements, the system reportedly allows for cash requirements scheduling and cash projection forecasting. Features include on-line aging of payables and on-line inquiry by vendor, voucher, invoice, check number, purchase order number and pay date.

The system includes validation routines and audit trails and has the ability to establish multiple liability accounts; it also possesses automatic and manual check-writing capabilities, the vendor claimed.

An interface is available to HMS' AIM/3000 General Ledger or other existing systems, providing automatic account distribution to the general ledger system and an interface for an associated purchase order system.

The on-line system is reportedly available for immediate installation at a price of $8,000. Further information is available from HMS Computer Systems, which can be reached through P.O. Box 35505, Tulsa, Okla. 74153.

Real-Time Option Unveiled

BETHESDA, Md. — Users of the Share-Eleven family of multiuser Digital Equipment Corp. RT-11 systems can now operate in a real-time environment with the release of a new option by Contel Information Systems, Inc.

The option supports more than 10K interrupt/sec, provides full kernel debugging facilities and has a graphics system performance monitor. Real-time program development is facilitated by a full set of system calls and utilities.

The real-time option is priced at $1,500 from Contel, 4330 East-West Highway, Bethesda, Md. 20814.

Tool Links Mainframes To Micros

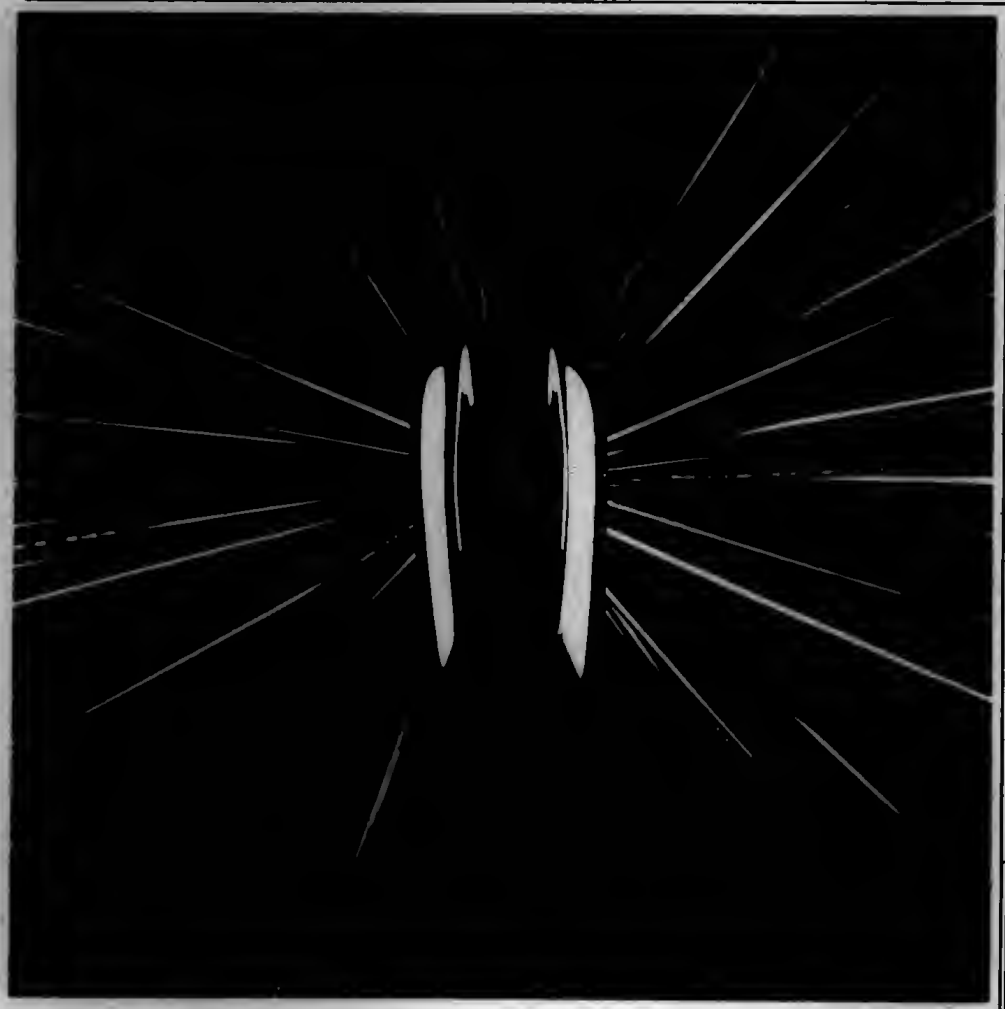
(Continued from Page 35)

gent, low-speed Ascii asynchronous terminal, while the file transfer function moves files between the microcomputer and the mainframe. This allows access to mainframe files while also permitting the micro to be used as a local workstation.

The software distribution facility allows on-line delivery of new or updated software releases.

Written in Pascal, Execustation works with any standard modem and RS-232 interface. The software resides on both the Personal Computer and the mainframe and will initially operate under IBM's VM/CMS telecommunications monitor, with TSO to follow later this year.

Execustation costs $200 for users who meet the standard monthly minimum for mainframe processing of $300. Charges for file transfer are $50 per connect hour. Informatics is at 6 Kingsbridge Road, Fairfield, N.J. 07006.



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Controls Switches From Common Console

Software Unveiled for CMS

NORWALK, Conn. — Data Switch Corp. has released software for its minicomputer-based Configuration Management System (CMS) that controls multiple computer/peripheral switches from a common command console. Under the software, CMS is said to have a simpler operator interface, extended configuration capabilities and additional security.

Operation of CMS is through a free-form command syntax, a color highlighting feature and an enhanced Help function, a spokesman said. Users can now use English language commands to predefine and store equipment interconnections, view the predefined interconnections and execute the selected configurations.

Color highlighting lets users display the high-priority channels and ports in red. The Help function can be invoked for any command, and portions of the Help file can be displayed and printed by entering a single command, the spokesman added.

Through a switch-editing capability, individual cross points can be connected by moving the cursor to the channel/port interconnections displayed on the screen. A reset command removes all cross points from one or more switches.

Data Switch said the software increases the number of allowable predefined configurations and "do-lists" from 100 to 200, and an optional security feature permits exiting from the run mode only through a special password, the company claimed.

The software is included on all CMS systems. A configuration, including from two to eight Model 1200 matrix switches, plus the CMS control console, costs from $150,000 to $500,000. CMS systems already installed can be field-upgraded free of charge by Data Switch, located at 444 Westport Ave., Norwalk, Conn. 06851.

System/36 Users Get Program For Schools

SALT LAKE CITY, Utah — An interactive and integrated set of software systems for use in schools as an administrative tool has been introduced here by J&K Computer Systems, Inc.

The program, called Comprehensive Information Management, runs on IBM's System/36.

It includes a financial management system, employee management system, warehouse inventory system, fixed asset inventory system, student administrative system, student attendance system and library management system, according to a company spokesman.

The software is priced from $14,500 from J&K Computer Systems, 3445 S. Main St., Salt Lake City, Utah 84115.

'Screen Painter' Out for Gamma

ATLANTA — Tarkenton Software, Inc. has announced the release of a Screen Painter option for the company's Gamma application generator.

The software, which runs on IBM and plug-compatible machines, reportedly allows entry of screen formats on a video device and features automatic line and column calculations. It also features horizontal scrolling for requirements over 80 columns and variable data element name prompting, the vendor said.

The Screen Painter is priced at $10,000 from Tarkenton Software at Suite 444, 3340 Peachtree Road NE, Atlanta, Ga. 30326.

Daly & Wolcott Enhances Accounts Payable System

WARWICK, R.I. — Daly & Wolcott, Inc. has announced an enhancement of its accounts payable management system for IBM Mapics and Dfas II users. Designed for use on the IBM System/34, -36 and -38, Version II adds vendor profile and open payables capabilities to the existing payment history function.

The software can automatically extract and save detail payment history by vendor, highlighting such information as average payment days for the last three invoices, to-date average invoice amount and high-balance amount and date. It also displays standard terms and date of first sale.

Users can look at open payables by totals or by detail with the total open broken down into age periods, the company said.

The Version II package includes all source code and documentation and can be purchased for a one-time fee of $500 for System/34 users, $650 for the System/36 and $900 for the System/38. Users of Version I can upgrade to Version II for a fee of $100.

The package is available from Daly & Wolcott, 120 Lavan St., Warwick, R.I. 02888.

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Abstract/38 Receives Enhancements

WHEELING, Ill. — Advanced Systems Concepts, Inc. has announced enhancements to its Abstract/38 documentation system.

The new features include jobstream flowcharts, analysis of command language program objects and data base command usage. The flowcharting module reportedly produces a graphics representation of application job streams, providing a detail of program nesting and file references.

The flowcharter will document all control transfers from one program to another and traverse library boundaries, the vendor said.

Abstract/38 carries a one-time license fee of $1,000, Advanced Systems Concepts said from 1084 Cornell, Wheeling, Ill. 60090.

UCC/CAM-100 Runs on PDP-11/23

DALLAS — University Computing Co. (UCC) has announced a numerical control manufacturing system. Available as a turnkey system, UCC/CAM-100 runs on Digital Equipment Corp.'s PDP-11/23 processor.

The software is designed in three modules, two of which are optional. The standard module consists of an editor for tape preparation and modification; a utility routine to read, punch and plot new tapes; and a back-plotting facility to read and plot existing tapes, the vendor said.

The optional software is intended to handle lathe and mill programming requirements.

The cost of the bundled turnkey package ranges from $24,000 to $40,000. The software is available separately for $4,000 for the standard module and $20,000 for all three modules. Further details are available from UCC Tower, Exchange Park, Dallaa, Texas 75235.

Sales Reporting System Links System/34 to 5260

CARSON CITY, Nev. — A sales processing and reporting system designed to allow the IBM System/34 to interface with IBM 5260 cash registers has been announced by Systems Design Consultants.

The Retail Sales System supports multiple stores and cash registers and can be tailored to support more than one company, the vendor said.

Written in RPG-II, the system is said to maintain inventory levels at the store, department and class level. A feature to establish a beginning inventory is included, as well as a complete physical inventory entry and reporting function.

Sales, purchase and transfer transactions are reportedly summarized for each month and maintained on the system for an unlimited period of time. Daily outputs include cash register detail and summary, salesman sales, purchases, transfers by store, department and class.

The product price is $2,999, including source code. Systems Design Consultants is located at No. 117, 625 Fairview, Carson City, Nev. 89701.

DEC Offers AAS Support

MAYNARD, Mass. — Digital Equipment Corp. has announced free support for users of third-party applications software designed for use on its personal computer product line.

Called Application Advisory Support (AAS), the service provides users with telephone assistance for both installation and operation of applications software sold under the Digital Classified Software (DCS) program. The DCS program includes any software that DEC has tested and evaluated for use on DEC micros.

AAS is a free service for applications software during the 90-day warranty period of a newly purchased DEC personal computer. DEC headquarters are in Maynard, Mass. 01754.

Producer Drafting System Updated

AUSTIN, Texas — Bausch & Lomb Interactive Graphics, Inc. has added a bill of materials package and Producer Application Language to its Producer drafting system.

The bill of materiala package is available on any system using a Winchester diak drive.

The package allows the operator to count the number of different parts, identified as figures or aymbols, used on a particular drawing, the vendor said.

The Producer Application Language was developed to enhance the Producer'a design capabilities. The package can automatically generate atandard part designs by entering key mathematical parameters, according to the vendor.

A atandard 27M-byte Producer system costs $59,995 from Bausch & Lomb Interactive Graphics through P.O. Box 14547, Austin, Texas 78761.

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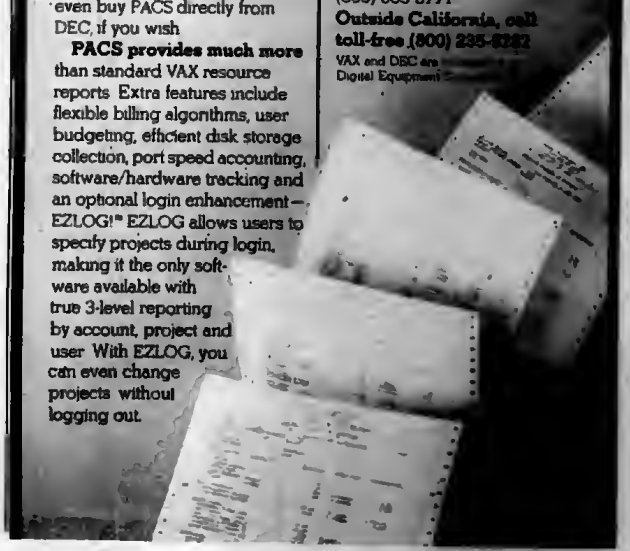

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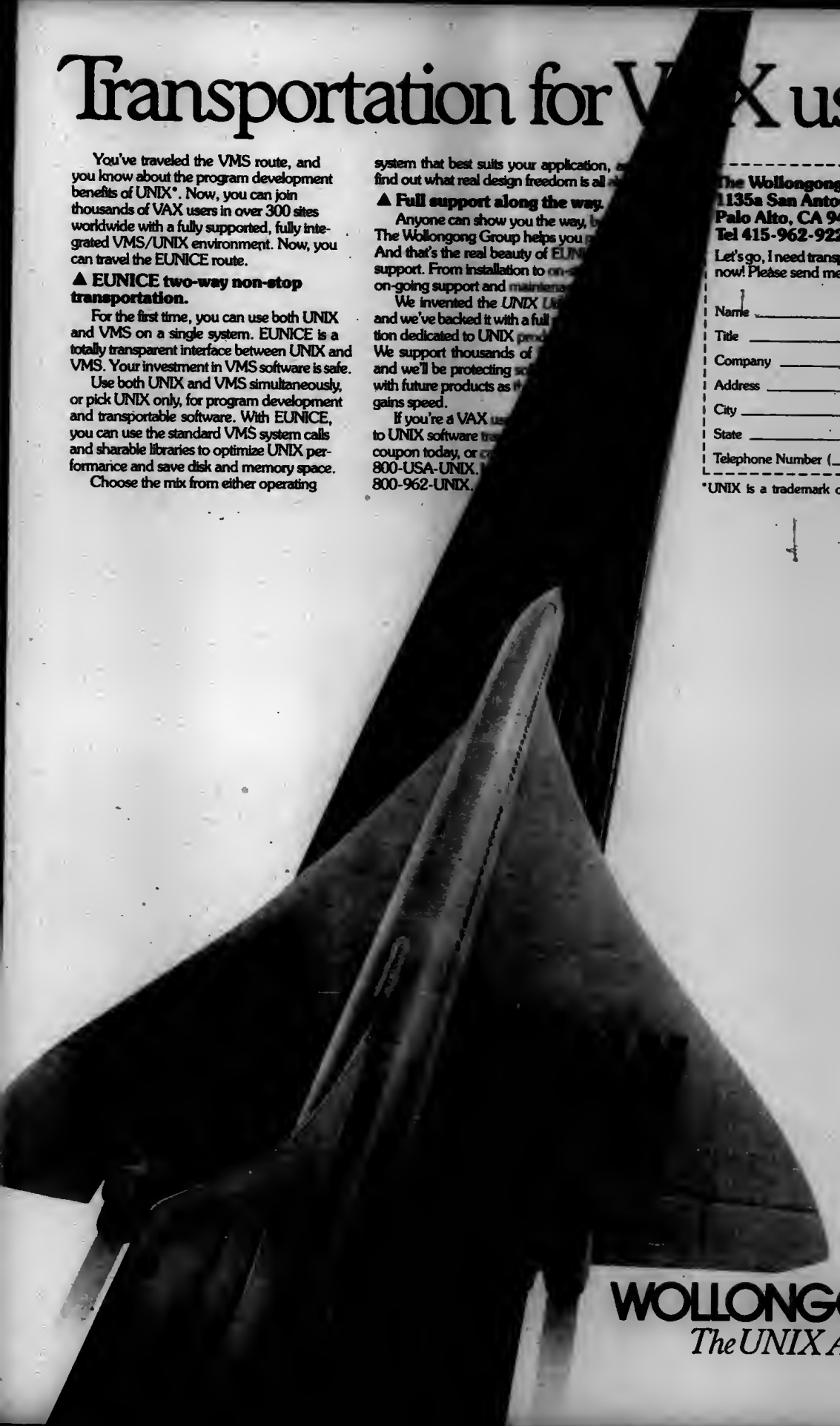


WOLLONGONG
The UNIX Authority

Real-Time Language System Unveiled for VMEbus Users

SUNNYVALE, Calif. — Astraea Computer Corp. has introduced a real-time operating system that is said to utilize the capabilities of Motorola, Inc.'s 68000 and 68010-based processors in Astraea's VMEbus systems.

VMEforth/32 is a 32-bit language system that reportedly allows the user to perform 16-, 32- and 64-bit mathematical operations in high-performance computer systems.

Features include the ability to address directly up to 16M bytes of memory with no paging; absolute control of the 68000 from the resident system with no overlays; and full 32-bit operating system capability, according to a spokesman for the firm.

The product is available on Astraea's VMEbus computers as both a real-time, stand-alone operating system or a high-level language for use with Digital Research, Inc.'s CP/M operating system.

VMEforth/32 costs $395 from Astraea, which is located at 846 Del Rey Ave., Sunnyvale, Calif. 94086.

'Impact/36' Out For Wholesalers On System/36

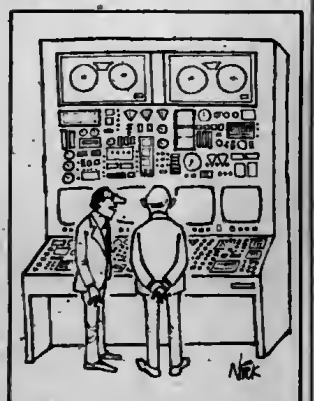
YOUNGSTOWN, Ohio — Impact/36, a software system designed for use by wholesale distributors on the IBM System/36, has been announced by Robert Routman & Associates here.

Impact/36 system functions include order entry, pricing, invoicing, back orders, drop shipments, special orders, accounts receivable, purchasing, inventory control and manufacturer's programs.

In addition, the Impact/36 system is integrated with the general ledger and fixed asset programs and includes payroll, inside and outside telephone salesman commission and sales analysis, warehouse production, truck routes and catalog programs.

Modifications to the systems can be made by the user or the developer as requested.

The system can be purchased for $34,500 from Robert Routman and Associates, which is located at 17 Colonial Drive, Youngstown, Ohio 44505.



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I/O Driver Out for DEC RT-11

STATE COLLEGE, Pa. — An I/O file driver that is said to allow Digital Equipment Corp. RT-11 disk files to be segmented into smaller file disks that retain the characteristics of individual disks has been announced by Interactive Microware, Inc.

Called Softdrive, the product creates several file disks, each of which can be initialized, copied to or from each other and listed on a directory. On multiuser systems, such as S&H Computer Systems, Inc.'s TSX-Plus, and on single-user systems shared by several users, each user can access private disks simultaneously, regardless of the number of users, the vendor claimed.

Softdrive is capable of emulating any disk that is smaller than the largest disk on a system and is compatible with all existing software with no modifications, the spokesman said.

The product is available for $200 on floppy disk.

Interactive Microware can be reached through P.O. Box 771, State College, Pa. 16801.

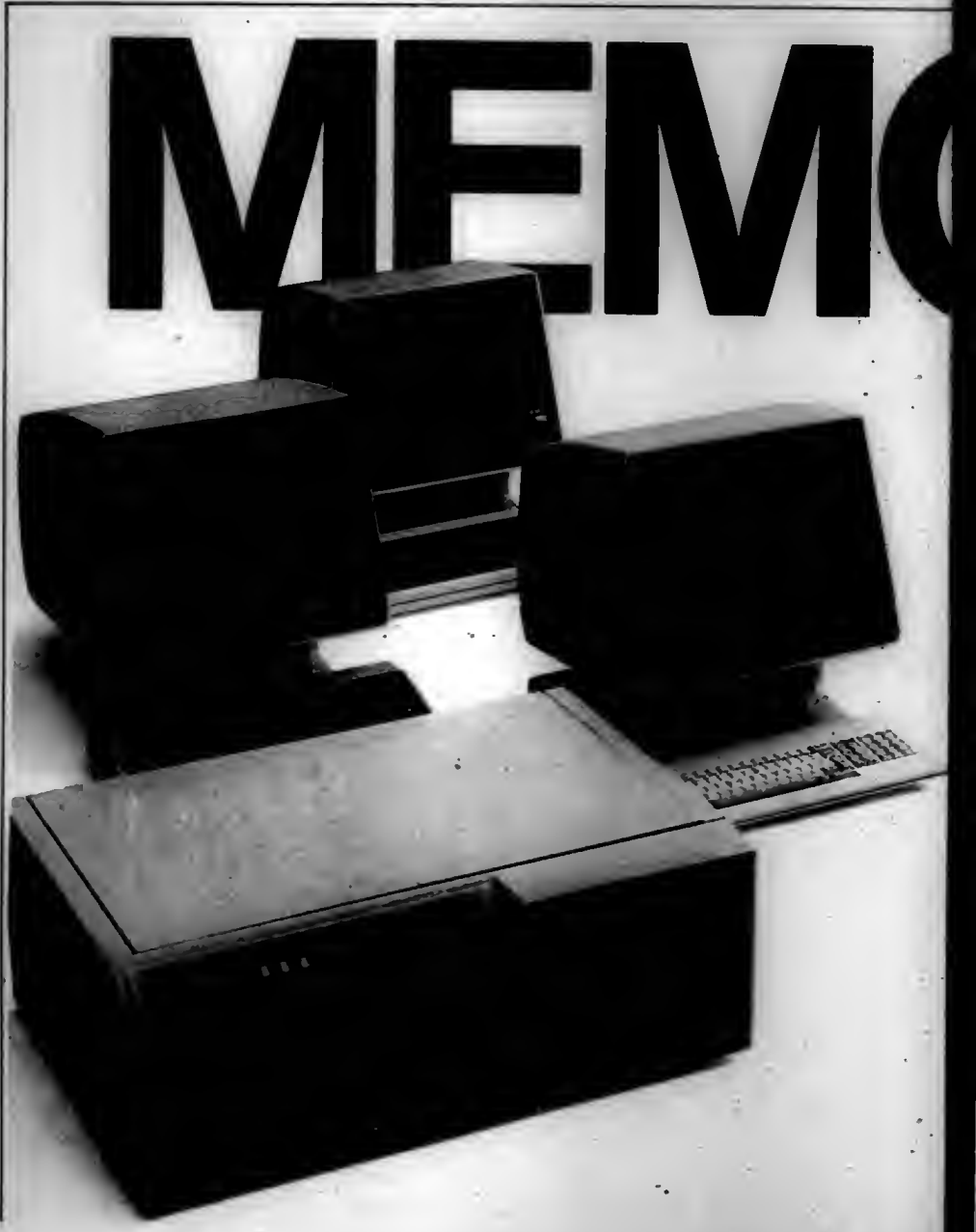
Structured Systems Courses Offered

CHICAGO — Seminars in "Structured Systems Analysis and Design" and "Structured Design and Programming" are now available from Predictable Systems, Inc.

The five-day on-site training sessions include approximately half of class time spent on charting exercises of progressing complexity, according to the vendor.

The systems analysis and design course includes sections on evaluating requests, analysis and simplifying system-level design. The design and programming course includes sections on designing programs, coding programs, quality control, maintenance, winning teams and time-saving tools.

Cost for each course is $2,995. Predictable Systems is located at Suite 825, 39 S. LaSalle, Chicago, Ill. 60603.



Using IBM EDX 3.2 Operating System

'DSD' Links Scorepad Terminal to IBM Series/1

REDMOND, Wash. — Software to link its Scorepad portable computer/terminal to IBM Series/1 computers has been announced by Azurdata, Inc.

Use of Direct Store Delivery (DSD) software allows store management to create cost and price schedules on the Series/1, downloading the information to the Scorepad at the beginning of the business day. As direct store delivery merchandise is received, it is checked for proper authorization, accurate cost and correct retail price. Invoice transaction data can then be transmitted to the Series/1 when necessary, a spokesman said.

The DSD system will link any Azurdata Scorepad to any Series/1 with the IBM EDX 3.2 operating system and a minimum equipment configuration of 124K bytes of memory, 9.3M bytes of disk storage and a communications controller with bisynchronous and asynchronous ports, according to Azurdata.

The software reportedly includes a screen maintenance program allowing the user to add, delete, review and list information; records can be tagged to be changed on a specific day. The communications protocol allows the Series/1 to communicate directly to the Scorepad on-site or remotely over phone lines, According to Azurdata.

The price of the DSD system is $12,500, and delivery is said to be 30 days. Azurdata is located at 4102 148th Ave. N.E., Redmond, Wash. 98052.

Data Base Analysis System Available on CSC Infonet

EL SEGUNDO, Calif. — A data base analysis system for reference and research applications is now available on Computer Sciences Corp. (CSC) worldwide Infonet remote computing network.

Called Creatabase, the system is said to reduce storage requirements for large data bases through the use of data compression techniques and speeds query processing through its special search logic. It is intended for use with either text or numeric data and also handles unformatted text, the vendor said. Typical applications include census files, bibliographic data, scientific data and medical and legal research.

Pricing for Creatabase is based on Infonet resources used, with no initial charges involved, according to the vendor. More information can be obtained from CSC at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

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Spooling System Announced For IBM CPUs

FAIR GROVE, Mo. — A terminal printer spooling system for IBM mainframes using IBM's CICS teleprocessing monitor has been announced by MacKinney Systems, Inc.

CICS/Spooler allows either batch or on-line programs to spool reports into the CICS/Spooler queue, according to MacKinney Systems. Reports may be sent to CICS printers or a batch system printer and may be viewed from a CRT before printing.

The IBM DOS/VSE version reportedly includes a utility to extract reports from the Power queue and load them into the CICS/Spooler queue.

The product reportedly supports multiple copies, header and trailer pages, and a report may be accumulated by a series of CICS tasks.

Distributed in command-level Cobol, the product is priced at $1,295 from MacKinney Systems, Rt. 2, Box 270-A, Fair Grove, Mo. 65648.

Compiler Gets DOD Validation

IRVINE, Calif. — Western Digital Corp. has announced that its Ada compiler for its 1600 series microcomputer has received validation by the U.S. Department of Defense (DOD). The compiler is said to be a production implementation that can be rehosted and retargeted to a variety of computers.

It includes a complete Ada software development environment consisting of the validated compiler, the Ada library, editor, file system and diagnostic listing program. The system operates within 128K bytes of main memory.

The hardware and software is sold as a turnkey system for $20,000 from Western Digital at 3128 Red Hill Ave., Costa Mesa, Calif. 92626.

Random Notes

Bimonthly Journal Serves Users of Dbase II Micro

DEERFIELD, Ill. — A new publication aimed at users of Ashton-Tate's Dbase II microcomputer data base software is being produced here by Idea Industries, Inc.

"Dnotes," a bimonthly journal, will focus on such issues as micro data base management, applications and forms design and data entry programs, as well as provide information on new programs, application packages and hardware, the vendor said.

A charter subscription to "Dnotes" costs $44, according to the vendor.

Idea Industries is located at 1580 Woodvale Ave., P.O. Box 86, Deerfield, Ill. 60015.

Software Productivity Aid Aimed at Boosting RJE Sites

SOUTHEASTERN, Pa. — American Data Management Systems, Inc. (ADMS) has announced a software productivity aid aimed at increasing communications at remote job entry (RJE) sites.

Aimed at the IBM Series/1 environment, Marjen is a menu-driven tutorial system that offers such features as selective report retrieval and spooling onto either disk or diskette from the host site, control of printing spooled reports and display as well as control of I/O at the RJE site, according to the vendor.

Marjen can be purchased for $2100, the vendor said.

ADMS can be reached through P.O. Box 661, Southeastern, Pa. 19399.

Spelling Verifier Added To 80-4, 80-3G Processors

WESTLAKE VILLAGE, Calif. — Wordplex Corp. has added Houghton Mifflin's Spelling Verifier to its 80-4 and 80-3G information processing systems.

The optional spelling verifier has a 53,000-word main dictionary based on the publisher's *American Heritage Dictionary*, the vendor said. Users can reportedly expand the software's capabilities with personal dictionaries of 750 words.

Pricing on the Spelling Verifier ranges from $500 to $750, Wordplex said from 141 Triunfo Canyon Road, Westlake Village, Calif. 91361.

Ada Software Course Offered Sept. 19-23 by Caci

ARLINGTON, Va. — A five-day Ada software engineering course is being offered here Sept. 19-23 by Caci, Inc.-Federal.

The course will use Data General Corp.'s Ada Work Center and the Caci-developed training package, Education for Ada Software Engineering (Ease), Caci said.

The training system includes more than 100 programs, packages and functions designed to develop skills in producing software. The course costs $1,200, and further information is available from Caci at 1815 N. Fort Myer Drive, Arlington, Va. 22209.

DEC Releases Source Book For PDP-11 Minicomputers

MAYNARD, Mass. — Digital Equipment Corp. has released a source book of programs for DEC's PDP-11 minicomputers. The 980-page "PDP-11 Software Source Book" features 33 categories of applications and systems software.

Disciplines include accounting/finance, agriculture, education, health care, engineering, manufacturing, research, sales/marketing, management and recreation. Each software entry lists the operating systems under which it runs, support levels and compatibility with DEC's VAX-11 superminicomputers.

A free copy is available by sending a request on company letterhead to DEC, Printing and Circulation Services, 444 Whitney St., Northboro, Mass. 01532.

Freight Software System Designed for Trucking

BANGOR, Maine — Coles Express has introduced the Freight Software System (FSS), a package designed for the trucking industry for use on the IBM System/38.

FSS reportedly handles on-line entry of freight and dispatching information and includes a traffic manager to track all freight in the system.

The package is priced at $70,000 from Coles Express at 444 Perry Road, Bangor, Maine 04401.

Tape Management Package Supports IBM Mainframes

SAN MATEO, Calif. — SDI Corp. has announced Release S.0 of its Epatava automated tape management package for IBM mainframe systems software.

The latest release allows users of the IBM DOS/VSE Release 2 operating system to use the package. In addition, Release S.0 is compatible with existing versions of the package.

Release S.0 is resident in IBM's Shared Virtual Area and is in a reentrant form. This eliminates the possibility of page-out operations, which can affect overall system performance, the vendor said. The program allows controlled and uncontrolled applications to open tape files without using a logical transient area.

The package costs $10,000, SDI said from 1700 S. El Camino Real, San Mateo, Calif. 94402.

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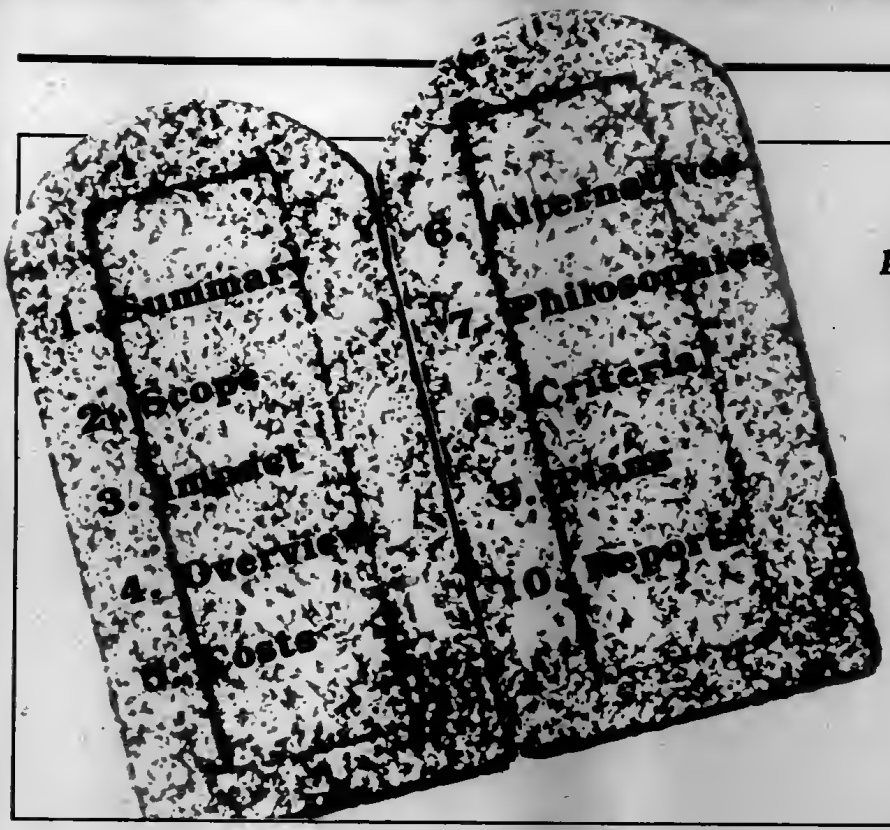

'The project expectations document will establish the ground rules . . . Any rules are legitimate as long as all participants concur when the project starts.'

A Practical Approach To a Project Expectations Document

By Lois Zells

Many project participants become sorely disillusioned with the feasibility study as it is conducted today. First, the study presupposes that when we are preparing the feasibility document, we are in a position to evaluate solutions. It asks us to recommend alternatives when we haven't even thoroughly defined the problem yet.

Second, the study does not deal with the confusion inherent in projects. Infused into every development effort there are many undefined and assumed attitudes. Given any project and two to N participants, there will be two to N views of the project. Furthermore, there are always dozens of subtle nuances floating like puffs of smoke over every enterprise, often in conflicting directions. We are called upon to crystallize these views, resolve the disagreements and disseminate this information to the community — before we even start the project.

It comes as no surprise that in many development efforts, the feasibility study is simply skipped entirely.

If the feasibility study is to serve as a true decision document for the customer, it must answer questions such as:

1. What exists in the current system? What is it doing correctly? What is it doing wrong? What is it not doing that it should be? What problems are created?
2. Is there some new way we can perform the functions that will benefit the organization and justify the expenditure?
3. What are the costs and savings of the alternative(s)?
4. What is recommended?

The deliverable from the feasibility study may be a project charter to proceed with developing a data processing product.

I propose we retain the meaningful parts of the project charter — for example, the cost/benefit analysis and statement of goals — but shift the emphasis and integrate new ideas such as the impact assessment and early clarification of the project development process. The product can be repackaged as a "project expectations document."

The most successful projects are not necessarily the biggest or most visible in the organization, but rather, those that truly do what their customers expected. Therefore, never underestimate the importance of managing organizational expectations. More projects fail because of inflated and unreasonable expectations than for any other reason. In any data processing project, effective presentation of the various agreements and decisions is a

IN DEPTH

must. The participants, who range from executive management to the hands-on operators of the system, need to understand the project and its deliverables clearly so they do not expect more than can be furnished.

The project expectations document will contain the usual executive summary, preliminary analysis and cost benefits summaries, but it will also emphasize all of the philosophies, assumptions, requirements, dependencies and constraints of the project development process.

Furthermore, the red-flag issues will immediately be brought into the open and objectively dealt with rather than put aside until they become emotional "hot potatoes." In the past, we have tried to bury the obstacles with the good hopes and intentions that time and short-term successes will overcome them; but unfortunately, we know from painful experience that they just don't go away.

Failures occur when project participants know that management cannot or will not acknowledge problems, thus increasing risks. However, even the most taciturn managers cannot refute facts clearly stated. Organizational expectations can then be realistic, approved, documented and disseminated. The project expectations document should:

- Clearly define the purpose of the project, clarifying what the system is supposed to do — and not do.
- Document organizational expectations, so decisions can be made from a reasonable knowledge base.
- Assess the impact of the project *and* the product on the organization.

The project expectations document will establish the ground rules before you start playing the game. Any rules are legitimate as long as all participants concur when the project starts. With this increased knowledge, management can then assess the venture's impact, determine if the organization is committed to successful completion and decide if the enterprise should be continued or abandoned.

Project Expectations Document

In *Controlling Software Projects*, Tom DeMarco says, "You can't control what you can't measure." I would add, "You can't measure what you can't define." And if you can't define what the organization is expecting, then your likelihood of success is a gamble of uncertain odds.

It is impossible to develop a generic solution to all projects in all companies. This article, therefore, presents a menu of suggested areas of interest along with sample questions you would want to answer in defining your project environment. Choose what is right for your situation from the following areas of interest:

1. Executive summary.
2. Scope of the project.
3. Impact assessment.
4. Systems overview.
5. Costs.
6. Analysis of alternatives.
7. Project management philosophies.
8. Criteria for completion, success and acceptance.
9. Project plans.
10. Management reports.
11. Management summaries.

1. Executive summary

Although it is the last job completed in the phase, the brief executive summary is the first item in the document and describes the findings of the phase just being completed.

A paragraph or two should be written about when and why the project started, the existing system's efficiencies and deficiencies, the new system's objectives and the proposed range of costs for the new system. Also present a synopsis of the cost/benefits analyses and the estimated completion date. It is important to emphasize that the costs and dates given at this time are ball-park figures rarely recognized for their accuracy.

Also included in the executive overview is a short assessment of the impact to the organization of doing or not doing the project.

2. Scope of the project

The main purpose of scope is to declare the boundaries of the project and the new product. Current manual and automated systems are

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specified. The customer organization is established, identifying the affected departments and describing their major areas and components. Customer roles and responsibilities are clarified. We decide what is to be built, what needs to be done and what range of investment the customer is willing to make. The priority of this project in relation to others as well as to ongoing business operations is defined. The role of the project manager is evaluated. And last, but not least, it is necessary to declare what the new system will not do.

The key to customer satisfaction at project implementation is initiating his active participation from the start and maintaining participation throughout. Given current attitudes, this requirement becomes a challenge. One of the most painful realizations we have been forced to accept in recent years is that customers perceive DP staff in a poor light.

Customer Relations

"Organizations do not need projects; they need systems," wrote Robert Block in *The Politics of Projects*. To build systems, customers employ so-called "project experts." Large amounts of money and time are spent, and expectations are high. But experts, of course, are not infallible. Systems are rejected, even if delivered on time and within budget.

Most often, however, systems not only do not deliver what the customer expected, but the projects are completed late and over budget. Time and money are wasted, and dissatisfaction filters up the corporate management structure.

Continued polarization between customers and data processing creates adversary camps.

This unproductive energy needs to be rechanneled and made to work for the organization. The environment should be restructured to foster team work and the commitment to an organizational product.

In order to achieve this goal, we should recognize that data processors are *not* the project decision makers. In the past, in our conscientious enthusiasm to do a good job for customers, we believed that *we* should drive the projects. The reality is just the opposite. We would not contract to build our dream house without committing our sustained involvement or expecting our opinions to be continually solicited and our choices to be incorporated.

Since data processors are only the builders of systems, why shouldn't customers of data processing "constructions" be required to provide the same level of participation?

Data processing should, therefore, be recognized as a service group to the organization, responsible for providing facts, alternatives and risks. The decision-making responsibility may then be moved back to the customer, where it belongs, allowing the choices to become organizational products rather than data processing projects

One of the most difficult obstacles to overcome may

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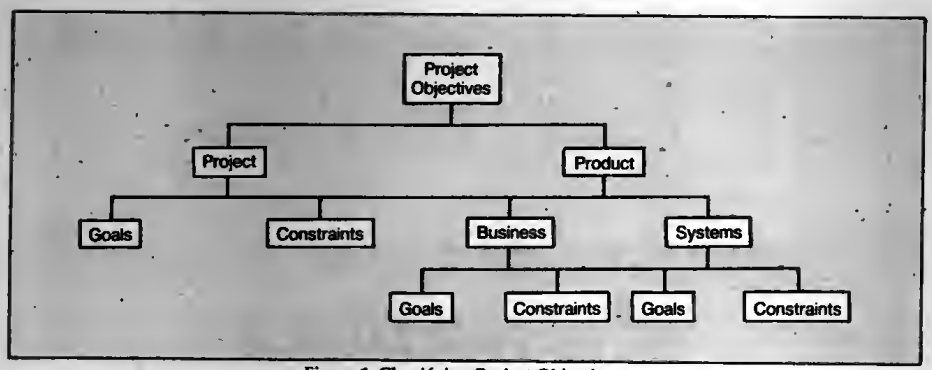

Figure 1. Classifying Project Objectives

be customer management's inability to perceive the need for active and sustained involvement. Understanding is improved if one by one the needs for their participation are addressed. For example, it is necessary to spell out how much time is needed, how many participants are required, how resource utilization will be optimized, what the advantages and disadvantages of customer participation in each particular job are and what the trade-offs are.

Assuming agreement for participation will be received, consideration should be given to who should participate and when. Managers and supervisors have a good conceptual understanding of the business perspective and may provide a good constraint to over expansion of project scope. Therefore, it is appropriate that they participate in the early phases of project development. Because they have a practical understanding of day-to-day operations that can only be gained by daily experiences over time, and because they will receive and use the product, the supervisors and operational workers should participate in all other phases.

After becoming familiar with the existing automated system, it is necessary to identify all of the customer departments who send input into the system and receive output from it. A word of caution is required here. Do not stop with the departments who visibly interface with the current data processing system. Many times outlying areas will also be affected and must not be overlooked. A good example is the mail room whose ability to effectively stuff envelopes with statements may be affected by redesign of these forms. It is also important to identify departments who will be affected by new system objectives as well as areas outside the organization that send data into and receive data from the system.

We need to find out all we can about the customer's organization: the hierarchy of job functions and its experience with data processing projects, for instance.

The most important task is obtaining the customer's agreement for his expected level of participation. It is necessary to describe customer responsibilities explicitly for:

- Requirements definition and reviews.
- External design and reviews.
- Approvals and sign-offs.
- Acceptance criteria definition.
- Test case development.
- Systems and acceptance testing.
- Conversion requirements definition.
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- Documentation.
- Problem management review.
- Change management prioritization.

Project objectives are divided into project goals and constraints and product goals and constraints. Product goals and constraints are then subdivided into system goals and constraints, and business goals and constraints. Figure 1 (on In Depth/4) illustrates this classification and Figure 2 provides examples in each of the categories.

For each project objective, the following should be specified:

1. Who is responsible for achieving the goal?
2. Who is responsible for monitoring the constraint?
3. How will the goal be achieved?
4. What conditions must be true to support achievement?
5. What conditions will prevent success?

Given the stated objectives, usually one or more of the goals are contradictory or exclusive.

Example 1:

Business goal: Maintain a competitive edge in the marketplace by introducing the new product in nine months.

Business constraint: The support data processing system must not cost more than $500,000.

Project constraint: The new supporting data processing system must be installed and operational within nine months.

Systems goal: Maintenance costs for the new system must not exceed $15,000 annually.

Systems goal: Subsequent modification requests must be completed within six to 12 weeks.

Conflict 1A: The analysis, design and construction of a system as large as the one being proposed will probably take longer than nine months.

Conflict 1B: When there are severe time pressures and target dates for completion, people do not work smarter, they just work longer, and error rates increase; and/or organizations may opt for a less thorough job of development.

The quick-and-dirty approach may negate the two systems goals.

Conflict 1C: There is no way to determine if *all* modifications can be completed within 12 weeks.

Conflict 1D: The customer has asked for a Cadillac and is only willing to fund a Chevrolet. It is unlikely the system can be developed for $500,000.

Example 2:

Business goal: Reduce the collections waiting period.

Business constraint: Costs must not exceed $200,000.

Systems goals: Automate delinquency and collections reporting; achieve on-line transaction response time of three seconds or less 95% of the time. Response times of five seconds or less are acceptable up to the 98% level.

Systems constraints: New system must run on current mainframe, already at 90% capacity, and must be a purchased software package.

Project constraint: Two entry-level analysts are assigned to select the package and two programmers will be assigned to install it.

Conflict 2A: It is unknown if a software package exists that could fulfill all requirements.

Conflict 2B: It is unknown if a software package can be purchased and installed for less than $200,000.

Conflict 2C: It is possible that the response time criteria will be unattainable, considering the current system's load.

Conflict 2D: Probability of successful project completion is reduced because of lack of project team expertise.

All of the objectives may be legitimate yet still conflict. These conflicts must be identified and resolved, a difficult process that may be best satisfied by sprinkling in a generous amount of management support.

Once the conflicts have been resolved, what the system will not do easily can be described. In order to ensure it proper visibility, this section should appear separately.

PROJECT	BUSINESS	SYSTEMS
Goals	**Goals**	**Goals**
1. Planning	1. Reduce operating costs	1. New, changed or deleted functions (manual or automated)
2. Measurement and control	2. Improve sales	2. On-line system available
3. Staffing	3. Improve customer service	3. Response time
4. Training	4. Improve data entry	4. Reduced maintenance
5. Documentation	5. Resolve reporting discrepancies	5. Increased Reliability
6. Change management	6. Reduce delinquencies	6. Modification flexibility
7. Analysis	7. Compete in marketplace	7. Other system support
8. Design	8. Legal requirement	8. Introduce new technology
		9. Quality software
Constraints	**Constraints**	**Constraints**
1. Project priority	1. Business priority	1. DBMS
2. Costs	2. Costs	2. Teleprocessing system
3. Time	3. Time	3. Hardware resources
4. Resources	4. Resources	4. Software development tools
5. Facilities		5. Batch processing window
		6. Programming languages

Figure 2. Specifying Project Constraints and Goals

Effects of Ranking

Priority is defined in the project objectives section. While a most important output of the process is to rank the project in relation to existing business operations (No. 1 under business constraints in Figure 2) and in relation to other projects (No. 1 under project constraints in Figure 2), it is also important to assess the rankings' ramifications.

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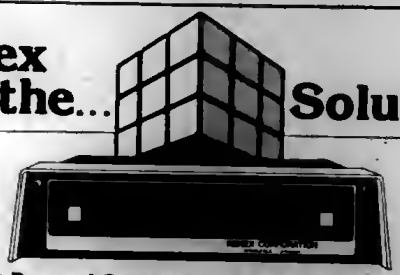

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Example 1:

Project B has priority over your project. A production failure last night means only one team can get computer time. Your team members and project B team members are competing.

Result: Naturally, project B gets computer time. Your team members go off to other work and try to play catch-up later when they get the chance. That approach, however, doesn't always work, and jobs that were waiting for computer time may be delayed or perhaps even late.

Example 2:

Maintaining existing business operations takes priority over your project. Customer service has promised you two people during the first two weeks in December to participate in testing. During the last week in November, the customer service supervisor informs you that a third person in his department just quit and that the department has received a rush job from the president. The supervisor apologizes, but he cannot deliver the resources as promised.

Result: Testing is delayed or late.

Both of these scenarios can delay project completions. Both resulted from organizational choices. If enough of these situations occur, the project can be very late. If the project is late, it is the result of poor organizational choice rather than poor project management.

Project Manager

The desire to manage projects effectively and be perceived as exceptional contributors stimulates our interest in many issues, not the least of which is how much control and responsibility is to be assumed and by whom.

The project manager may oversee definition of project objectives, development of the system analysis and design, planning and staffing the project, analyzing risk, monitoring progress, adjusting schedules, reporting project status, controlling budgets and salaries, preparing performance appraisals and managing changes. The project manager may also handle the more intangible jobs such as communicating, interacting, selling, delegating, motivating, appraising and counseling.

The passage above reads like a job description, perhaps even yours. Are you comfortable that it explicitly states the factors that contribute to your job success? How does your management see you? How do the customer and customer management see you? What do your workers believe your role is?

Considering the ambiguous assumptions floating in all the players' heads, it is appropriate to answer the following questions:

1. How experienced should a project manager be?
2. Does he have that level of expertise? Do you need outside consultants? Can you get the funding for them?
3. Is the project manager given the latitude to manage, or is he actually a coordinator and liaison for management?
4. Which project participants is he accountable for?
5. Does this person control salaries?

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IN DEPTH

6. Does he have the authority to hire and fire participants?

7. Does he control the budget?

8. What role does he have in change management or scope definition?

9. Is project management a full-time job? Or is the project manager also responsible for producing a deliverable (for example, an analysis specification or a coded module)? What percentage of time will be allocated to each of the areas? How do we track the time? What are the ramifications of excesses in either category?

10. Do written guidelines exist for the project management process? Will they be used? If there are none, what effect will this have?

Assess the opportunities and riska with each alternative. Qualify what may happen, given the scenario you paint, and resolve any conflicts with your management. The result will define the boundaries of your management environment.

3. Impact assessment

With the introduction of the impact assessment, a helpful dimension is added to the development effort. Often as data processors, we assume that our project is pure goodness. How can customers fail to love and embrace it? The project may be delivered on time and within budget. It may be a faithful representation of the requirements. Yet the customers are unhappy. Why? Can the project then be considered a success?

If there is any chance of resistance, the situation should be assessed early. Perhaps the condition can be overcome through publicity or increased cuatomer participation and decision making. But if the project will have a truly negative effect on the organization, let us know about it now. If we cannot correct the problems, do we still want to spend money on a white elephant?

'If there is any chance of resistance, the situation should be assessed early. Perhaps the condition can be overcome through publicity or increased customer participation and decision making.'

The impact assessment answers such questions as:

1. How will the customer react to the new system?

2. Will there be any areas of resistance?

3. Can we overcome resistance with increased customer participation or a change of design?

4. Will a change in documentation or the training mode make a difference?

5. Will existing operations change?

Evaluating these issues early in the project enables informed and effective decision making, acting on our environment rather than reacting to it, consciously selecting survival or abandonment of the project.

4. System overview

Although the project expectations phase is a preanalysis, it is nevertheless necessary to initiate some high-level analysis at this time. The job ahould not be made unreasonably complex at this preliminary level. The real job of analysia will be done in the next phase, if the project gets approval to proceed.

To document both the manual and automated systems, the managers and supervisors responsible for customer departments, major sections and major business functions should be interviewed.

The systems overview explains the current system's deficiencies. Key features of the new system are identified and new functions described. The major inputs and outputs are defined and other aystem interfaces declared. Performance requirements may be included. Pertinent information about existing hardware and software is provided.

The following suggested topics provide a partial framework for selecting appropriate areas for current and new systems.

a. Business functions overview.

b. Major inputs, outputs and data atorage units.

c. Transaction, screen and report descriptiona.

d. Other system interfaces.

e. Description of control features (logs, approvals, audit trails and so on).

f. Performance history: processing time, on-line response time, average and peak volumes, expected volume growth.

g. Current systems deficiencies: exceptions to standards, missing functions, error rates, poor response times, other delays, redundant functions, costly functions, operational problems, security violations, incompatibility with other systems.

h. Poor future expansion prospects.

There is a natural tendency at this stage to forget that this process is a high-level analysis and to plunge to the detail level. Discipline should be exercised to constrain the outputs to simple lists and descriptions. It is unwise to spend a great deal of effort on analysis before it is known if the project will continue beyond the current phase.

5. Costs

Costs must be determined for informed decision making, evaluation against benefits, budgeting and establishing the yield on the investment.

Costs to date and projected costs to completion will be reported at the end of this phase and as each subsequent phase is completed so management can make informed go/no-go decisions. Development costs may be weighed against the benefits of anticipated savings in operations, high returns, improved service or tax savings.

The payback period for return on investment and discounted cash flow techniques, such as net present value and internal rate of return, may be used to compare the yield on the investment against other potential ventures.

In our continued effort toward managing organizational expectations, it is important to stress that estimates at thia atage can be misjudged by as much as 70% to 200%.

1. Who ia responaible for doing the cost/benefits analysis?

2. What constitutes development costs? Operating costs? What costs will be excluded?

3. What are the assumptions for costing?

4. What ia the range of error for the assumptiona?

5. What degree of accuracy is expected for costs that are evaluated during each of the phases in the development life cycle?

6. How often will the cost/benefits analysis be recomputed?

7. Will the project manager have a.

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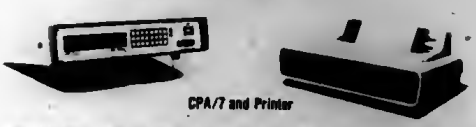

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IN DEPTH

discretionary fund allotted for miscellaneous expenses? How much?

6. Analysis of alternatives

In order to avoid expending further effort on work that ultimately would yield no benefits, it is advantageous to gather sufficient information to enable the early elimination of unfeasible solutions. Now that you have defined the project objectives and completed the preliminary analysis and a study of costs, it is appropriate for the project team to use this information to present several alternatives to management.

Although I advocate the judicious postponement of design work until you are actually in the design phase, it is necessary to do a limited amount of high-level design now. This work will take the form of evaluating possibilities for automation boundaries, for equipment types and for the purchase of software packages. As in preliminary analysis, I want to caution you not to get trapped into doing a detailed design before you have completed the real job of analysis.

If one doesn't already exist in the organization, it is advisable to prepare an inventory of production hardware (data processing, data entry, typewriters and so forth) as well as existing software systems (other than the one you are studying). This work can be beneficial in analyzing costs of the considered alternatives.

It is then necessary to designate which parts of the new system will be manual and which will be automated and then map them into hardware and software requirements. This procedure is very simple in some projects because they are exact rewrites of an existing system. Most organizations recognize, however, that new systems development is the time to look for opportunities to improve old systems by automating new functions. The issue then becomes one of deciding how many new enhancements can be made while still justifying the expenditure.

How to Identify Alternatives

1. Using the project objectives and the preliminary analysis of manual and automated systems, start by viewing the new system definition as though it were a completely manual system.

2. Determine if it is feasible to automate everything. If so, this possibility can be the highest level alternative.

3. Other scenarios are simply chosen from a variety of smaller subsets of the highest level alternative(s).

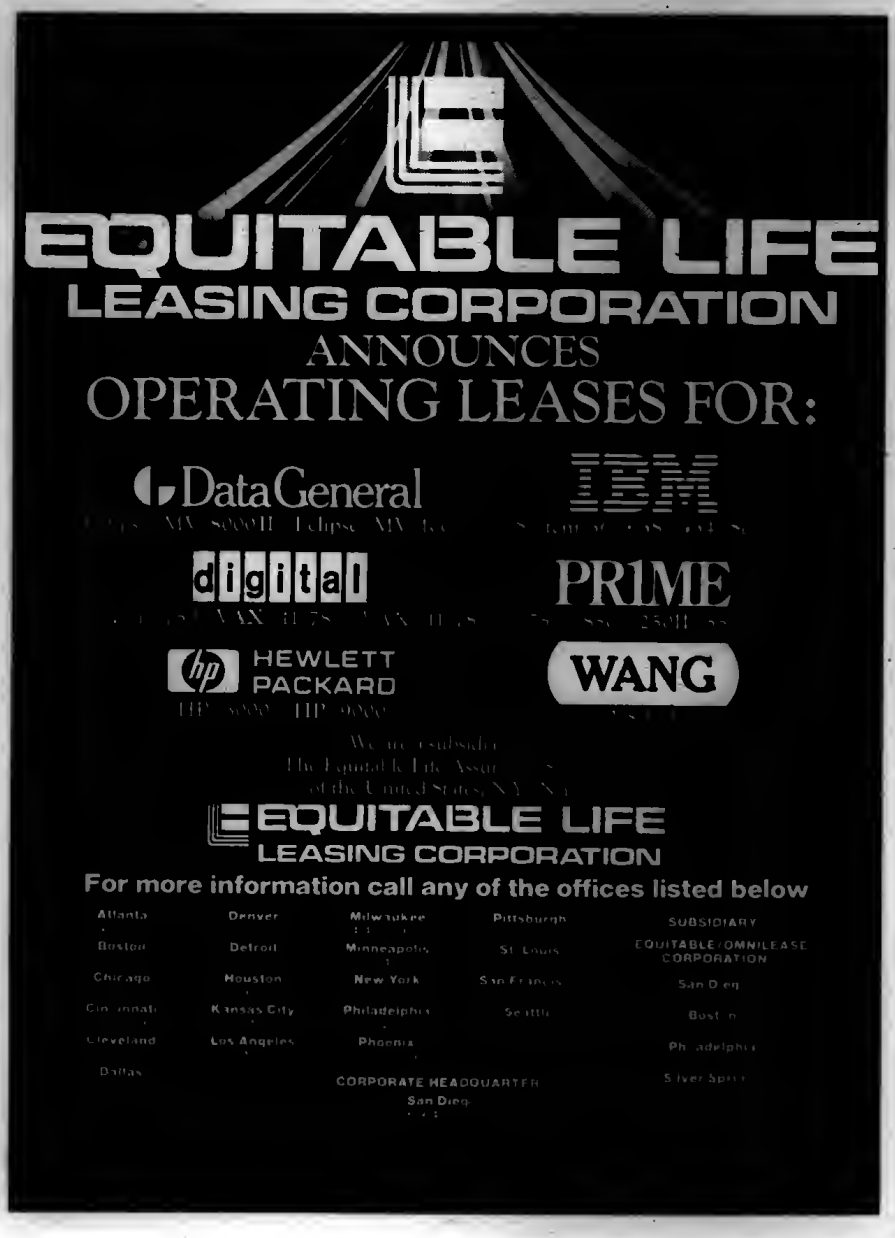
4. It is also possible that incremental implementation stages can be considered as scenarios or alternatives.

5. Software packages may be considered at this stage, but only for the purpose of ruling them out. This is not the time to choose software packages. Even though your ultimate intention might be to use a software package, you still need to identify your requirements (that is, to complete the analysis phase) before actually selecting the package for purchase.

If new hardware or software purchases cannot be considered, the alternatives may be mapped into the inventory of hardware and software currently available in the environment. Depending on objectives, it is entirely possible that you may also salvage portions of the existing systems software or even software from some other system.

Summarizing the Findings

For each of the alternatives, classify the project by size, opportunities and risk. (In *Software Engineering Economics*, Barry Boehm classifies projects as small, seven man-months; medium, 300 man-months; and very large, 7,000 man-months.) Summarize the key features, major functions, assumptions, advantages and disadvantages. It will then be necessary to do a high-level comparative analysis of costs, resource requirements and completion schedules for each alternative. You might be thinking that the amount of work involved seems considerable, but it is necessary for an honest analysis. Although there is no denying that this work requires effort, realize that because the scenarios have been developed as subsets, there will also be



PROJECT EXPECTATIONS

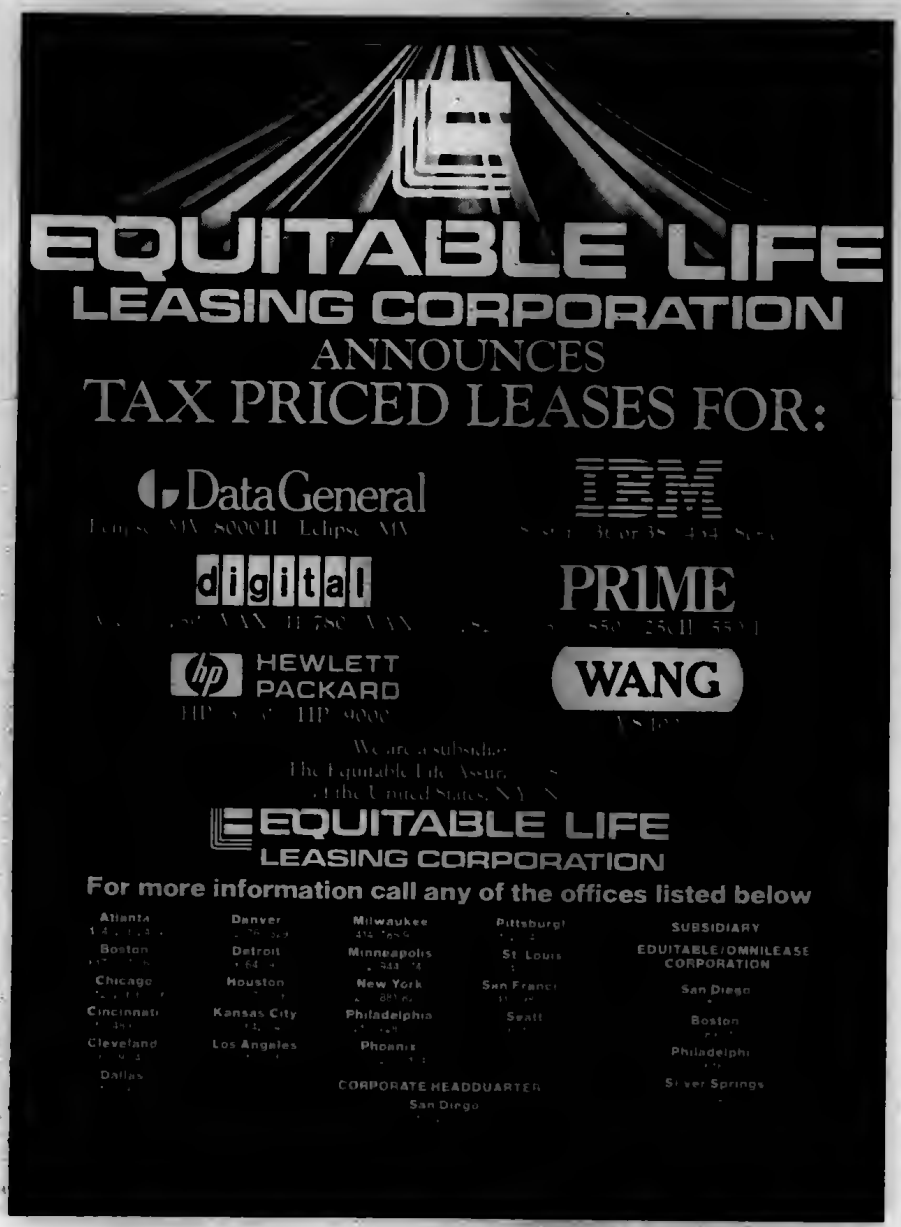
some degree of overlap between the tasks.

And, too, you are only working at the highest level of detail.

Recognizing that these conceptual designs may change in subsequent phases (but they must be created now in order to serve as the basis for the evaluations), it is important to stress to management that this analysis is comparative only, that estimates are simply estimates.

With the increased knowledge gained in subsequent phases, some (or all) of the assumptions could be disproven. However, the desire for increased knowledge is, after all, why we conduct the subsequent phases.

'If a project methodology already exists, then customize it to fit your project. The team should be careful not to plunge into the time-consuming and expensive development of a new methodology.'



7. Project management philosophies

It is necessary to define, select and approve the tenets of project management for the following items development life cycle; planning philosophy; change management plan; review and approval of plan; organizational plan; status reporting plan; and miscellaneous constraints, assumptions and dependencies.

I have avoided crowding all of the interpretations into the single heading of constraints, assumptions and dependencies because I have found that in trying to select and approve the solutions to questions, it was often difficult to isolate the issues. Partitioning makes it possible to deal with one group at a time.

As you proceed, you may realize that this process is very closely related to developing project management standards, guidelines and procedures for your company; or customizing existing project management standards, guidelines and procedures for your project.

I do not propose that your team arbitrarily try to create the corporate project management strategy. However, if the company does not have a written plan for project development, perhaps it would be appropriate to negotiate for the time to do it now, either by your project members or by another group chartered with the responsibility. Make no mistake; if these rules are not currently in place, creating them will be a labor-intensive effort which can only be successful if the organization consciously commits to its desire to gain control of the project development process by allocating the time and resources to do a good job.

If a project methodology already exists, then use this time to customize it to fit your project. Although every project is unique and the development approach needs to be modeled to specific needs, the team should be careful not to plunge into the time-consuming and expensive development of a new methodology.

Development Life Cycle

Traditional project development usually follows some set of steps from start to completion. The steps may be a series of ad hoc responses as needs are recognized, or the project may be completed using a formalized development life cycle. Furthermore, a given project may select a limited number of steps from the methodology or from a combination of methodologies. Some of the steps to consider are:

Step 1: The life cycle philosophy.

a. Will we use phased implementation; cyclical analysis and design; concurrent analysis, design and development; prototyping? What are the opportunities and risks with each approach?

b. Will we customize our methodology? What phases should be used?

IN DEPTH

What are the inputs and outputs of each phase and the activities and tasks? How many people should participate? How will we know the phase is completed?

Step 2: Analysis and design.

a. What is analysis? What are its objectives? How detailed must the analysis specification be to do a good job defining what the requirements are? To serve as inputs into design?

b. Is a design goal increased system reliability, reduced maintenance costs, increased flexibility for modifications?

c. Do we front-load the analysis and design effort, giving recognition to these processes when they should occur, or do we allow them to surreptitiously emerge during testing?

Step 3: Testing.

a. Is the organization interested in quality insurance? Is independent testing viewed as a process to improve quality and reliability of systems?

b. Will this project have a separate, independent testing team? If so, who will be responsible for fixing errors discovered — the developers, the testers or a separate group of "fixers"?

c. What will be tested?

d. What role will the customers play?

e. If we have a separate, independent testing team, what skill levels should its members possess?

f. Is it possible to plan accurately how long the corrective process will take? Are there development techniques that shorten this process, such as structured systems development?

Planning Philosophy

We must help the organization understand that project planning is an iterative process. It is impossible to present a comprehensive and detailed schedule for implementation on the first day of a project. Furthermore, it is unlikely that an inclusive project plan that is precise can be completed before design is finished. Consequently, as we migrate through the development life cycle, our knowledge base of the project becomes broader, and we are able to refine the plan continually. We will also tell the organization the method of partitioning the work and the way in which we calculate dates.

1. Should the identification of the jobs to be completed and the estimates for how long they should take be done by the workers and/or their supervisors or by a separate planning and estimating group?

2. How small must a job and its estimate be for us to have a high degree of confidence in its accuracy — one day, five days, 20?

3. What is a reasonable amount of time for producing a plan?

4. Remembering that planning is the identification of the many jobs to be done, the estimates of how long they will take and the recognition of their interdependencies, is the process of refining a plan reiterative? If so, how many recursions are reasonable?

5. What degree of accuracy for the plan can we expect at the end of each phase? At what point in the project plan can we feel that we have a complete and comprehensive plan?

6. How accurate are short-term, mid-range and long-range estimates? What outside forces can affect estimates?

7. What effect can part-time resources have on completion dates?

8. What are the assumptions used in planning?

9. Will we use crash times and costs?

'Any time we attempt to freeze a specification, we are deceiving ourselves. We are only restricting the system's view of the real world. Admitting that we can not control change, we will manage it by implementing easy-to-follow procedures.'

Change Management

Change is inevitable. Any time we attempt to freeze a specification, we are deceiving ourselves. We are only restricting the system's view of the real world. Admitting that we can not control change, we will manage it by implementing easy-to-follow procedures.

1. What procedures and forms are necessary for a change management function?

2. Who should lead the change management function — the project manager, the customer, a steering committee?

3. Who should participate in analyzing change requests?

Should it be be the project analysts and technicians? Should it be the developers or should it be a separate change analysis group?

If it is the developers, how can time spent in analyzing change requests affect development schedules? Should extra time for developers to perform change analysis be factored into the plan? If so, how do we determine the amount, and what happens if we exceed it? If not, how do we handle the effect the additional time has on completion dates?

Should a separate change analysis group be designated? Should it be the group ultimately assigned to maintain the system? What are the opportunities and risks?

What role does the customer play in change analysis?

4. Who should participate in prioritizing change requests — project analysts and technicans, customer workers, customer management, data processing management, executive management?

5. Who needs to be informed regarding the effects approved changes will have on completion dates, resource requirements and completion costs?

Reviews, Approvals

As the specifications are created, they must be reviewed: The final documents from each phase, the analysis specification, the project plans, the design and so on must be approved. It is advisable to itemize all the activities in the project that need ratification; the procedures and participants for walk-throughs, formal inspections and quality assurance reviews should be identified.

1. Who should participate — customers, technical experts, maintenance representatives, data base administrators, data communications specialists?

2. If prior study of the product to be reviewed is necessary before the review, how many days lead time should be allowed?

3. So each individual can have adequate time to prepare for reviews, how much time should be factored into the plan?

4. Should the review be postponed if participants are unprepared?

5. If we have 300 modules, will we review the design specifications, program code, test cases, test results for all 300 modules?

6. What is the risk if reviews are omitted? What does it cost to fix an error discovered in analysis? If you wait until design? If you wait until implementation? What is the company willing to pay to correct errors?

Organization Plan

The organization plan describes the partitioning of the project into specialty groups, the assignment of participants to groups and the identification of the group members' percentage of participation.

1. How will people be organized? Will they be matrixed? Dedicated to the project? Is there some other

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grouping format that can be used?

2. Will departments other than data processing designate resources to become part of the project team?

3. What will the group charters be? What levels of control will be established? What responsibilities and accountabilities will be designated? Who will be the managers? Who will distribute the work and who will do it?

4. If there are conflicts in whether a resource works on a job for our project or another job, who resolves the conflict?

How can that affect our project?

Status Reporting

If the organization has no reporting system, an evaluation of alternatives (which should include a manual reporting system, purchased packages and internally developed software) may be presented along with a recommended plan of action.

If a project control and accounting system is already installed, it is important to indicate which reports will be used, who will be on the distribution lists and how often the reports will be used.

Each project manager may customize the procedures for reporting and tracking, covering issues such as:

- Time accounting turnaround documents.
- Narrative status reports.
- Frequency, content and distribution of periodic reports.
- Content and distribution of management summaries.
- Procedures for exception reports.

1. Who inputs to the system — the project manager, project team, customer management, customer workers?

2. Who receives system output — the project manager, upper management, customer managers, all project participants?

3. If we can report progress at the milestone level, at the activity level within milestones, at the task level within activities and at the subtask level within tasks, to what level of detail do we want to track progress?

4. In addition to regular project activities, will we also report status affected by administrative and clerical support (or lack thereof), customer participation (or lack thereof) or departments beyond our sphere of influence

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IN DEPTH

whose work affects our progress?

5. How will we measure and report on nonproject work such as scheduled maintenance, and more maintenance than planned for, administrative or management overhead?

Constraints, Assumptions

Having defined the major categories, we are left with those issues that seem to stand by themselves, such as:

1. Is management aware that the choices for adjusting a late project are:

- Accepting the slippage, that is, adjusting the schedule to the later dates.
- Applying more resources — working overtime, assigning the super-workers, adding people, assigning the experts.
- Eliminating features — deleting functions, implementing versions or eliminating "gingerbread."
- Doing a less thorough job, which means risking reliability reductions, maintenance increases or failures.
- Cancelling the project.

2. Is management concerned about maintenance costs? What can be done to reduce them and are they considered part of project costs?

3. Are all project members expected to be experts? Do they all start out as experts? Is there a training period, a learning curve? Can members make mistakes or false starts? Rather than be expected to be experts, are members recognized as "professional learners?" Does this agreement apply to project management alone or extend to application familiarization also? What about developing technical expertise?

4. If it takes six months to achieve 85% perfection, should the project team spend another six months to achieve 95%? Where is the point of diminishing returns, and does it vary by application?

5. Is it possible to choose an alternative and after pursuing it for some time, discover (with increased knowledge gained) that it was the wrong alternative? Is it appropriate to abandon the effort and try another alternative? Is there a certain percentage of completion that enters into this decision?

6. If management chooses a target date and advises the project team to retrofit the project into that time frame, are they aware that some of their options are.

- Applying more resources — working overtime, assigning the super-workers, adding more people or assigning the experts.

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IN DEPTH

'Success may be described from varying perspectives. Management, customers, operations, project members all have their own criteria for success. Acceptance testing is the final process that satisfies the users that the system is operational.'

- Eliminating features.
- Doing a less thorough job.
- Agreeing to do the whole project in the slotted time and then finishing late and over budget.
- Agreeing to do the whole thing, but only committing to a schedule so great it covers all contingencies.
- Agreeing to do the whole project in the slotted time, finishing on time, making the specifications ambiguous and insisting that any missing features are not part of the original specifications.
- Asking for another assignment.

8. Completion, success and acceptance testing criteria

It is important to stipulate, early in the project, the conditions for determining that the project is finished, successful and acceptable.

Agreeing on a terminating landmark prevents project completion from floating toward infinity. But how will we know when the project is finished? Will the conclusion of an activity such as acceptance testing or the shakedown period indicate completion? Will the system be considered delivered after it has run error-free for some prescribed period of time? The criteria for terminating the project must be specified now.

Success may be described from varying perspectives. Management, customers, operations, project members all have their own criteria for success.

Acceptance testing is the act of simulating a live environment with conditions that will exist after day one of implementation. It is the final process that satisfies the users that the system is operational.

1. Will the customer participate in acceptance testing?
2. Who will participate? What jobs will be done? When? How will the work be done? How long will each job take?
3. How long will acceptance testing be? When will it take place?
4. What will be tested?
5. What will the plan be?

9. Project plans

At the conclusion of the expectations phase, the project may be continued or canceled. If the decision is made to carry on, the next phase will be analysis. During this stage, a parallel group of activities for the first intensive planning effort in the project will also be occurring. Restated, the next phases that occur will be analysis and planning.

The project expectations document will contain three sets of plans: a detailed plan for analysis, a detailed plan for planning and a high-level plan for project completion after analysis.

10. Management reports

Major milestones, major responsibilities, prelimary resources requirements and the identification of new issues are identified. High-level network diagrams such as Pert/CPM or Gantt charts are also drawn.

11. Management summaries

A summary of the project expectations phase as well as a summary of the plan are prepared. Problems and their resolutions, possible pitfalls and successful approaches are described in summaries of the current phase and project history to date, and a narrative of the planning effort is written.

To document organizational expectations takes time and people. Managers who resist dedicating time and resources to this process early in the project are deceived into believing the effort will not be expended later in reacting to undefined expectations: A construction project would not be launched without defining the method of building as well as what was to be built. If it were, there would be misunderstandings and the necessity for demolition and reconstruction — time-consuming and costly — or living with the error. The same analogy can be brought to project planning.

Our purpose is simply to minimize the effects of surprise and unpreparedness. As you gain experience and credibility, you may find that unwarranted projects, which in the past would have gone on to completion even though they should have been canceled, will be recognized earlier and be nullified.

People who want the project at any cost will attack the process or the team members and ignore the projections. When approval is received, project development can proceed very rapidly and productivity levels can be significantly raised.

About the Author

Lois Zells is a senior staff consultant for Yourdon, Inc. in New York. In addition to speaking at European conferences, she has addressed sessions of the National Computer Conference and the Federal Computer Conference. Early last year, Zells developed Yourdon's Project Planning and Control Workshop. She is currently working on a text tentatively titled The Practical Guide to Project Management, *to be published next year by Yourdon Press. This article is drawn from several sections of the book.*

SPECIAL REPORT

Fine Tuning the Terminal Picture

Edited by Jim Bartimo and Katherine Hafner

August 29, 1983

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Terminal Makers Stressing Color, User Comfort

By John Witherow
Special to CW‡

Many terminal manufacturers are beginning to feel like Dorothy in *The Wizard of Oz*. Back at home in the world of the standard CRT terminal, although life may have been boring, it was more or less stable. However, in the early 1980s, things began to appear in color, and many manufacturers suddenly got the distinct feeling that they were not in "Kansas" anymore.

Today, more than ever before, manufacturers and prospective buyers are focusing their attention on user considerations when assessing computer design. This trend, which is influencing software as well as hardware, is due in part to the ever-increasing number of word processing, data entry and data processing professionals.

When first introduced into offices in the 1960s, the CRT terminal was as much a point of novelty for its unaesthetic design aa it was for its advanced technology.

Like early TV sets, which had found a home in American living rooms 15 years earlier, the CRT's cabinetry was not much more than a utilitarian casing housing a technological miracle.

However, as the "miracle" of computer technology became a standard, if not mundane, business tool for day-to-day office use, the designs slowly departed from the original box-like structures to the sleek, ergonomically sculptured models of today.

Unlike the Americans, European manufacturers almost immediately recognized the CRT for what it was: a unit of furniture as well as a business tool and began designing it as auch. The stylish European designs, far from being entirely cosmetic, incorporated many advanced ergonomic features, including tilt-and-swivel screens and nonglare amber displays — all aimed at user comfort.

As the trend toward ergonomics continues, the use of color terminals is becoming an alternative that cannot be ignored. Color CRTa, once viewed as instruments for use almost exclusively in specialized research applications, such as geological and chemical analysis, have been making their way into an increasing number of offices.

Dramatic Price Reductions

Probably the best reason for the increasing popularity of color CRTa in the general-purpose computer environment is the dramatic price reductions over the last few years. Whereas only a short time ago a color terminal could cost considerably more than $10,000 per unit, today's terminal can cost less than $1,300 per unit.

Another reason for the switch is that an ever-increasing number of businesses are discovering more and more applications for color terminals in daily office procedures. These applications were specifically designed to reduce user fatigue and increase productivity.

'Color CRTs, once viewed as instruments for use almost exclusively in specialized research applications, such as geological and chemical analysis, have been making their way into an increasing number of offices.'

Surveys have determined that users working on color terminals reported fewer instances of eye strain as compared to those working on conventional CRTs. And, when given the choice between a color display — even without specific color applications — users also expressed a preference for the terminals that enabled them to change the colors of the display according to their moods or the jobs being performed.

Color, however, becomes even more valuable when combined with color-oriented software. When color terminals are matched with this specialized software, users are provided with a method by which to distinguish various input and output areas.

One of the most popular office applications for color today is to highlight errors or call user attention to important information.

This application becomes especially effective when working with information that is organized in a form or application format and where repetitive viewing of similar material may affect accuracy.

A New Jersey hospital recently made the switch to color terminals. The color is particularly useful to doctors, nurses and technical personnel because it can call attention to specific patient information, such as a doctor's failure to complete a patient's chart or a patient's history of allergic reactions to a drug.

The hospital also uses the terminal for administrative tasks, such as highlighting important information, including a patient's insurance data. In both administrative and medical applications, the terminals allow users to identify quickly and accurately a great deal of important information through the use of color.

By utilizing color in software applications, another dimension is added to the information appearing on the screen. The informahon is added in an immediately recognizable form and without the need for additional characters. This new dimension of information literally shouts at the user for attention and is more effective than the addition of characters to the screen.

There is also strong evidence that the use of color may serve to stimulate the artistic (right) side of the brain. In normal computer operations, the user typically makes use of only the analytical (left) side of the

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Editing, Conversational in the Lead

Study Forecasts Winning Terminal Types of '87

Users' new yearning for distributed data processing is taking its toll on the terminal and data entry equipment market, according to the recently released "1983 Statistical Reference Book" from International Data Corp.

Terminals designed for conversational, editing and clustered processing applications will therefore see an increase by 1987. Other devices, such as those for keypunch, remote batch and optical character reading, will fail to meet with substantial growth, the study reported.

"The overall installed base of data entry terminals currently constitutes over 8,300,000 terminals estimated to be valued at $17.3 billion," the study noted. "By 1987, units are expected to reach almost 22 million installed, representing $28.1 billion in dollar value."

This growth can be attributed primarily to the distributed data terminals' 95% dominance of the installed base, which is projected to grow to 99% by 1987. Other terminals will decline from their current 5% of the market to capture only 2% in the same year.

By Jim Bartimo
CW Staff

FRAMINGHAM, Mass. — There will be some winners and some losers in the terminal market over the next five years.

Among the losers will be remote batch and optical character reader page and line reader terminals, according to International Data Corp.'s (IDC) recently released "1983 Statistical Reference Book."

The following are selected market forecasts from the study on the winning terminal technologies in 1987.

Conversational CRT Terminals. IDC observed fierce price competition in the area that includes such products as the Digital Equipment Corp. VT-100. An 18% installed base growth rate in this market is predicted by 1987, but the line between this area and the next category is blurring as editing capabilities are added to conversational terminals.

Prices are expected to decrease from $725 in 1982 to $275 in 1987.

Conversational Keyboard/Printer Terminals. The increased demand for remote hard-copy devices that are easily transported was cited as the reason that this type of device will increase by 17% in installed base compounded annually through 1987. Many of these devices are compact and transportable or are larger units such as DEC's Decwriter.

Editing CRT Terminals (IBM 3270 type). A slight decline in the sale of 3270 terminals was predicted, owing mostly to expectations of a new generation of terminals from IBM. Approximately five million of these terminals are expected to be installed. Upgrade kits to turn the terminals into personal computers were also predicted by the study.

The 3270-type terminals will decrease in price from $2,200 at present to $1,480 by 1987.

Editing CRT Terminals (IBM General Systems Division type). These interactive terminals, manufactured by the now-defunct General Systems Division of IBM, remain in the form of the 535, 529 and 479 terminals. With an average of 16.8 of these terminals per IBM System/38, this market holds huge potential.

The growth rate for these terminals is almost 25.6% annually in shipments and more than 34% yearly in installed base through 1987. If IBM cannot meet the demand for these terminals, it is expected that plug-compatibles will spring up.

This type of terminal will decrease in price from $2,800 to $2,400 per unit by 1987.

Editing CRT Terminals (Honeywell, Inc., Sperry Corp. and Burroughs Corp. type). Shipments in this market are expected to decline over the next five years, since 1982's shipments were not high. Emulation packages from independent companies will make more terminals act like those in this market, the study said.

These terminals should decline in price from $2,600 to $2,100.

Editing CRT Terminals (Other). This market will experience a high rate of shipments and hold at 28.3% compounded annually over the next five years. The demand is created by users' need for various protocols and editing capabilities.

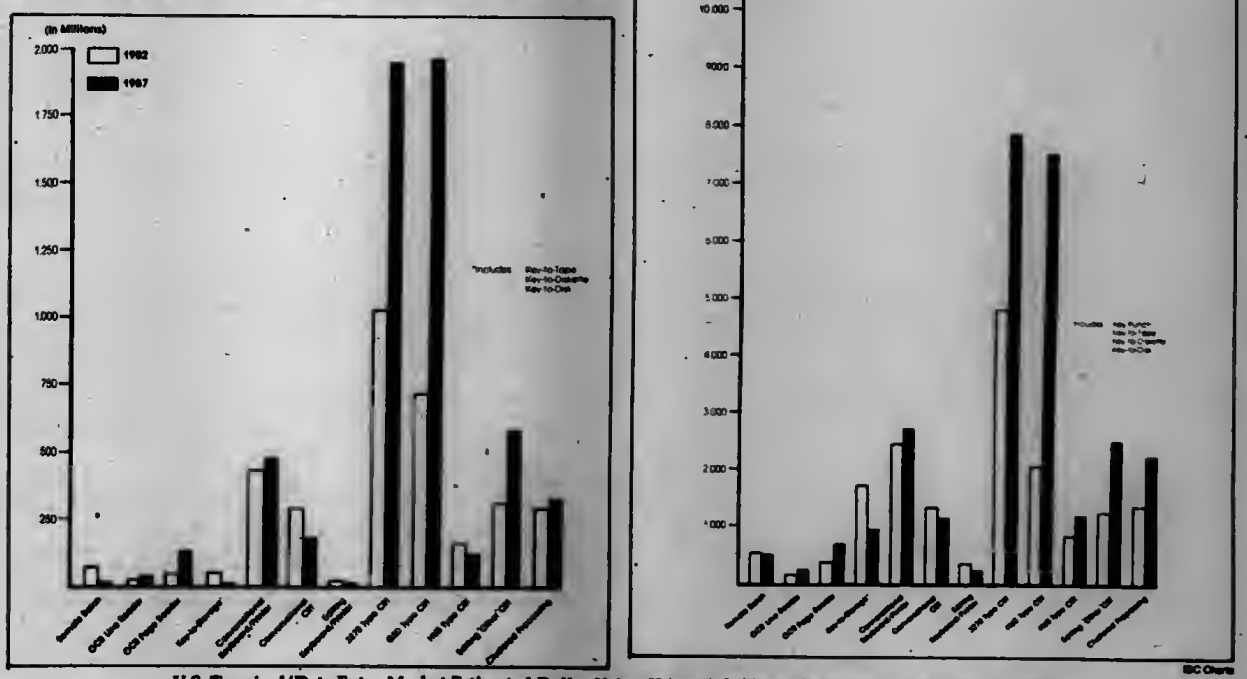
Prices for these terminals should decrease from $1,020 to $550 by 1987.

Clustered Processing Terminals. These terminals, designed for a distributed data processing environment, "received a solid boost from IBM with the introduction of the 5280 in January of 1980 and the increased production and shipment of the 8100," the study noted.

Datapoint Corp. and Four-Phase Systems, Inc. are the top two vendors in this field with IBM coming on strong. This market is expected to grow at 16% annually when compounded from 1982 through 1987.

These terminals should decrease in price from $3,000 in 1982 to $2,400 in 1987, according to the study.

The study is available for $3,500 from IDC, 5 Speen St., Framingham, Mass. 01701.



U.S. Terminal/Data Entry Market Estimated Dollar Value Shipped (left) and Estimated Dollar Value Installed

NAPLPS: A Boon for Graphics Terminal World

By Mark Gordon
Special to CW‡

In the midst of acceptance as a North American standard, the North American Presentation Level Protocol Syntax (NAPLPS) has much to offer the graphics terminal world. NAPLPS is an Ascii-based technique for coding graphics and text information in CRT terminals.

The public comment period required by the American National Standards Institute and the Canadian Standards Association prior to its acceptance ended in May of 1983. Declaration as an American and Canadian national standard should follow in late 1983 or early 1984.

Who will use NAPLPS? Information providers are a prime example of those interested in such a syntax. Time-sharing services with on-line data bases, publishers of electronic media, government agencies seeking to inform segments of the populace and advertisers looking to sell products are potential users.

The compactness of NAPLPS encoding saves storage space and reduces transmission time for images sent to remote locations. These features will be attractive to those in business graphics and computer-aided design and manufacturing.

What will NAPLPS do? First, it will allow pictures created on one device to display correctly on another device. A yellow circle at the center of the screen will look the same on all the devices used to display it. It will be sized at the time it is drawn by the decoding device so that it always occupies the same percentage of the output device's display surface.

This is a form of device independence. For those interested in portability, preservation of software investment and access to more than one vendor for components, this issue is of great importance.

As a further example, consider the yellow circle again. Since it is coded as an "opcode" with parameters rather than a collection of points, the smoothness of its curves depends only on the resolution of the current output device. If it is drawn on a low-resolution device and subsequently displayed on a device with more dots per inch, the latter display will make full use of its great resolution.

This scenario will also apply to diagonal lines. Staircases will appear on inexpensive devices, while better resolution will cause the same lines to appear more smooth.

Since NAPLPS has been endorsed by a large number of well-known organizations (AT&T, Digital Equipment Corp., Intel Corp. and Tektronix, Inc. are notable examples), it should be around for quite a while. It provides a standard interface to conforming devices, meaning that investments in software relying on it will be preserved.

Based on Telidon Standard

This syntax is actually based on the Telidon standard developed by the Canadian Department of Communications. Telidon is the Canadian version of videotex. This is a generic term for the process of transmitting frames of information containing text and graphics to the home (or some other location) for display on a TV set.

Viewers may interact with the transmitting device by means of a keyboard or other input device. Telidon is used by the Canadians to disseminate agricultural information to farmers. AT&T was one of the prime movers involved in enhancing Telidon to create NAPLPS.

(Continued on SR/6)

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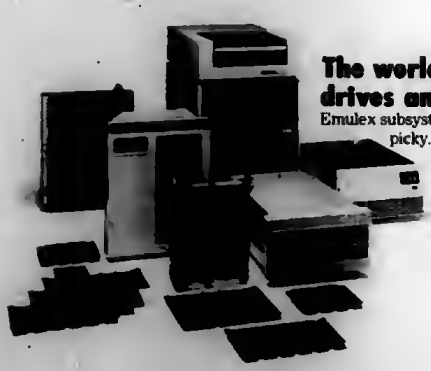

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Color CRT Units Showing Jump In Popularity

(Continued from SR/2)

brain. By including the right side in the work process, the user draws on a new area of creativity and attention.

Today, with increasing interest in color, we are witnessing what will probably be the beginning of a trend in affordable and diverse color software, as well as the affordable color terminal.

Venture Development Corp. of Wellesley, Mass., stated in one of its studies that by 1986, nearly two-thirds of all U.S. alphanumeric CRT manufacturers will offer color terminals. It is safe to assume that software will increase proportionately.

And if the trend continues, it seems a certainty that color terminals will do for office automation what the color television did for home entertainment.

Witherow is vice-president and general manager of the terminal manufacturers at Applied Digital Data Systems, Inc. of Hauppauge, N.Y.

Controller/Terminal Networks Replacing Personal Computers

By Scott Brear
Special to CW‡

The issue of how to best handle the man-machine data processing interface is as old as the computer itself. In fact, after the initial jump from programming boards to punched cards, the industry has maintained the IBM 029 keypunch data entry keyboard standard for more than 20 years.

Key-to-card evolved into key-to-tape, but until key-to-disk arrived, users still had to transport the written media into the computer host environment to be read and subsequently processed hours later. The DP environment was essentially a batch environment to the typical corporate citizen.

When the first IBM 2260 terminals arrived (later to be replaced by the 3270 series), and on-line data bases became a reality, the power of computing reached far beyond the management information systems (MIS) department into all sectors of business.

Remote warehouses came on-line, and instant airline reservations became possible. Indeed, users became dependent on information and were quite annoyed if it did not appear within a few seconds of their command — a far cry from 24-hour batch processing.

Faster Modems, Mainframes

The man-machine interface had progressed so well that users were demanding more and more applications and the power to run them. Technology responded with faster modems, faster mainframes and larger storage devices — all available at an ever-decreasing cost.

Public networks were established by GTE Telenet and Tymnet, Inc. to exploit the massive user need to access wide-ranging data base files around the world. Finally, the user terminal became "the computer" to the non-DP operator of these ubiquitous devices.

The horizon was not all bright, however, as the growing user base was required to wait months (or even years) for applications that would help them with their daily information needs.

Moreover, even the increasingly powerful CPUs and their peripheral devices could not handle all the demand required of them without careful, long-term fiscal, physical and application planning.

Finally, the cost of data base access or data entry retrieval, in terms of telecommunications and terminal costs, kept the services from all but those whose daily activities depended on the proverbial three-second response — for example, programmers, reservations agents, accountants and so on.

Until the arrival of powerful pocket calculators and personal computers, the DP industry was far removed from the terminal-on-every-

(Continued on SR/6)

Controller/terminal networks, such as this one from The Braegen Corp., are already replacing personal computers.

Getting your system in front of management is finally made simple.

Now your system can be accessed quickly and easily with Northern Telecom's Displayphone terminal. It's as simple to use as a telephone. And compact enough to fit on everyone's desk.

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MIS professionals in a variety of industries have discovered the Displayphone® terminal, an ideal solution to the problem of user acceptance. Voice and data are integrated into one compact unit whose sophisticated capabilities are so easy to use, everyone will welcome it on their desks.

Menus of features and functions, visual prompts and terminal-resident soft keys guide even novice data users through correct operation easily. And soft keys can also be downloaded from your host computer for single key activation of program commands. As an advanced business telephone, the Displayphone unit brings the convenience of voice features such as directory dialing to data calls, and allows simultaneous voice and data communications.

In addition to its ease of use, the Displayphone terminal offers powerful data access.

It is an asynchronous terminal that can also be configured to operate in IBM 3270 and other sophisticated computer environments. This flexibility gives users high speed access to a full range of corporate and public data bases.

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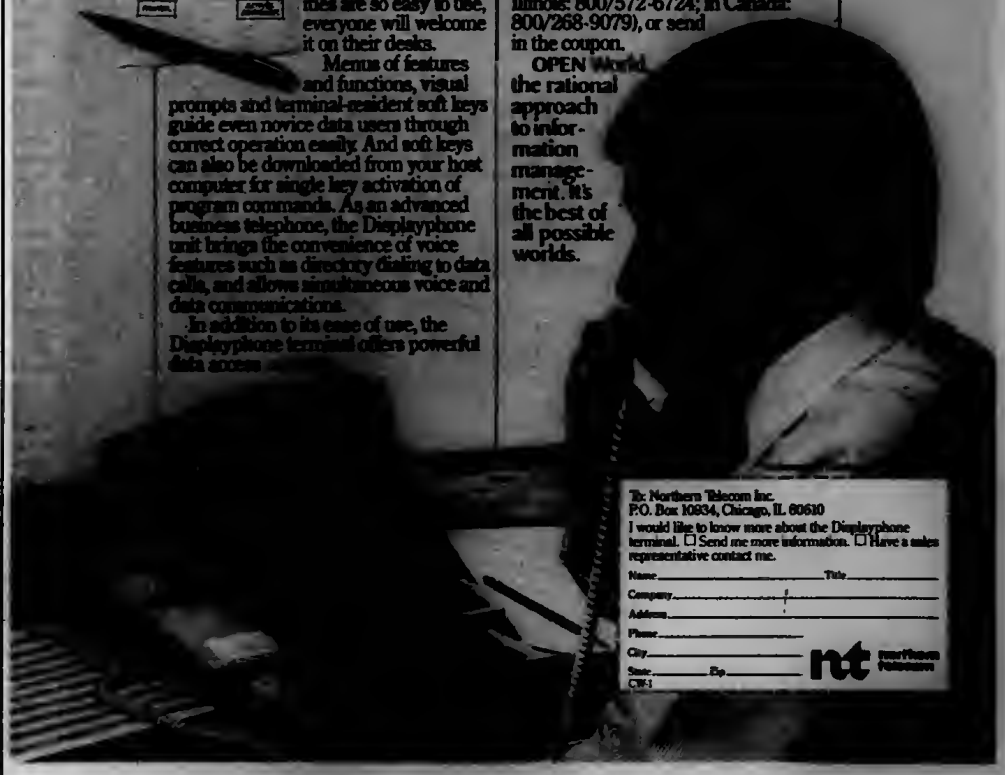

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P.O. Box 10934, Chicago, IL 60610
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CW-1

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Controller/Terminal Nets Take on the Micros

(Continued from SR/5)

desk scenario portrayed by many futurists.

The arrival of the personal computer could not have been more timely: Everyone wanted information and wanted it in a format that was immediately useful. Users wanted to obtain information without lengthy meetings with systems analysts and without endless political and economic jockeying with the MIS department.

In most cases, buying personal computers cost far less than developing and running applications on the corporate host.

Applications packages such as Micropro International Corp.'s Wordstar, Sorcim Corp.'s Supercalc, IBM's DB II and Lotus Development Corp.'s 1-2-3 all seemed to be the answer, freeing the corporate "everyman" from the corporate host and its real and perceived restrictions. However, after a very short divorce from the MIS department, users realized that they did need the tremendous power and storage resources of the central processing center.

Limits of Adapters

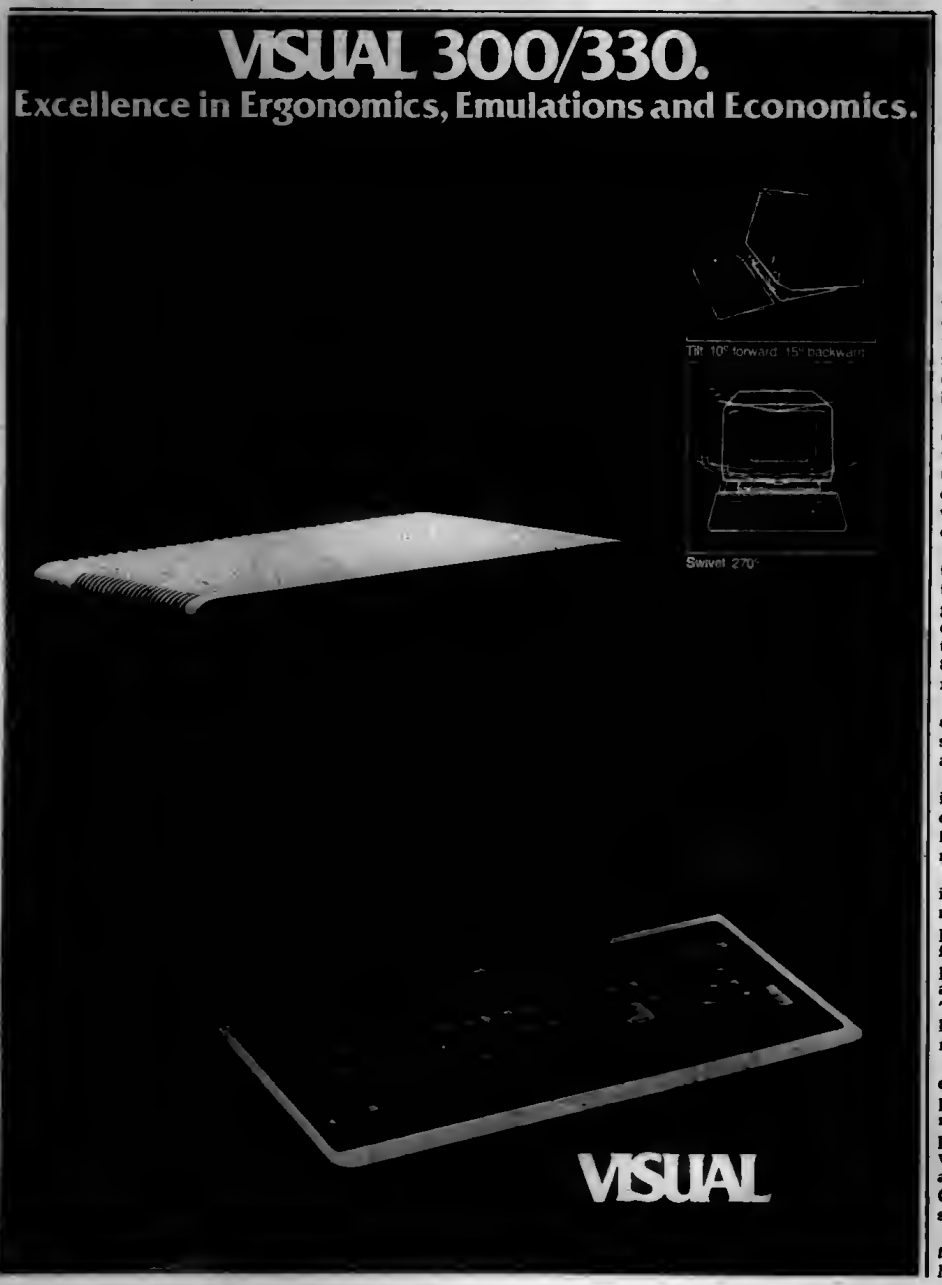
The industry responded with telecommunications adapters to allow personal computers to assume Ascii terminal personalities, but these were limiting in two ways: Not all host applications could be accessed, and the personal computer lost some (or all) functions while behaving as a terminal.

Perhaps more important, this approach was frequently more expensive than using stand-alone 3270 terminals and had only 80% of their capability.

The next wave of host personal computer interconnecting devices showed even more emphatically the importance of 3270 terminal operations to users. Coaxial adapters, protocol converters and 3276 emulators became available that allowed the personal computer to assume as much 3270 personality as possible without becoming one.

This, in turn, opened up new operational possibilities such as file transfers between personal computers and host memory and/or mass storage.

(Continued on SR/8)



NAPLPS to Aid Terminal Users

(Continued from SR/4)

A close look at NAPLPS reveals that quite a lot of thought has gone into its creation. Its internal details have been carefully considered, as has its relationship to other protocols necessary for interconnection of computers and their peripherals.

In the grand scheme of things, NAPLPS resides logically below application software, but above the details of a communications link. Its designers chose to make it an example of the sixth of the seven levels defined by an International Standards Organization (ISO) model. This model seeks to describe a communications system as a series of layers, each interacting with, but unaware of, the details of layers directly above and below it.

Lower levels deal with the physical details of a communications pathway such as the circuitry used for establishing a connection. The seventh or highest level of this model provides services directly accessed by an end user in a typical application.

All NAPLPS codes are bytes, either 7 or 8 bits in length. The selection of 7 or 8 bits is made at the beginning of a session. In a 7-bit environment, all codes are identical to those found in the Ascii set. In an 8-bit environment, the bit normally reserved for parity is used for data.

The widespread use of the Ascii coding scheme ensures an easy transition to use of NAPLPS. Data paths are normally at least 7 bits wide.

The handling of text by a decoding device is similar to that of a standard Ascii terminal. Existing text files may merely have additions made to them to add graphics.

The NAPLPS designers left room in the standard for future developments. The sets mentioned above as part of the NAPLPS definition are features of this syntax. They are also part of a larger scheme that includes a method for creating new "C" and "G" sets. This scheme relies on well-known ISO code extension techniques for an expansion framework.

This framework permits, and even encourages, expansion. Users or implementors may define sets of commands or symbols for a particular application. These have the same weight within the syntax as sets that are a part of its original definition. Once created, they can be used in the same way as predefined sets.

Gordon is marketing manager for Verticom, Inc., a start-up manufacturer of NAPLPS terminals.

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CallCost Manager is only the latest reason why ROLM systems are the choice of the top Fortune companies, and, increasingly, the preferred solution to digital networking. In fact, there are more than 12,000 ROLM CBXs worldwide and over 10,000 data devices communicating through ROLM systems. (That's more than all other PBX manufacturers combined.) And they're doing it now. Not tomorrow. Now.

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Talk to us about CallCost Manager. You'll know a lot more about your phones, and your phones will feel a lot better about themselves.

ROLM. NOW.

As Man-Machine Interface

Personal Computers Competing With Terminals

(Continued from SR/6)

This latter benefit raised issues of security: Where will the corporate data reside? What if floppy disks with sensitive information get into the wrong hands?

Along with this "bolted-on" approach came the "built-in" approach. This concept — personal computing capability built into a 3274 look-alike controller — is an approach that considers the inherent economies of scale of centralization and the multi-user capability available to each 3270 user on the cluster.

The built-in approach takes the view that personal functions — not a multitude of personal hardware — are what users want. The built-in solution to the personal computer requirement solves the need for true 3270 host access while still giving users the flexibility of local, low-cost personal processing.

In the near future, users will see personal computer capability integrated as a service function into large-scale, 3270 local-area networks.

This trend will continue through generations of more preprocessing on an increasingly local level. Functions once performed by the mainframe are now being done by network controllers, and much of what is now being done at the controller level will eventually be transferred to the terminal level.

'In the near future, users will see personal computer capability integrated as a service function into large-scale, 3270 local-area networks.'

This will include both private local data base work and local manipulation of subsets of the mainframe's data base.

Personal computing power is stepping out through the network's three tiers. It was first at the mainframe only and is now at the controller, where it is replacing the need for individually assigned minicomputers.

It will be available next at the local terminal level, compatible with both the mainframe and central controller.

An illustration of thia is the slowing of the growth rate of intelligence on mainframe computers as the limits of present technology are approached, while the intelligence available on personal and small business computers has been growing almost exponentially in recent years.

This will lead to growing availability — and growing use — of true intelligent workstations, capable of performing local processing and calculation while continuing to offer complete mainframe access as authorized.

These workstations will be individually tailored to the job of each employee, with different capabilities and different entry mechanisms for different users.

As this becomes more universal, standardized communications between terminals and mainframes, and from terminal to terminal, will also emerge.

In time, as communications schemes achieve thia standardization, and possibly earlier as gateway devices make the interface between computers truly universal, the real differentiation between one system and another will be the number of terminals and peripheral devices that can be included in a given network scheme.

Eventually, in most business environments, data entry terminals will no longer compete with personal computers, but instead replace them as part of integrated networks of data communications, personal communications and local data processing.

Brear is director of marketing for The Braegen Corp. of Milpitas, Calif., a manufacturer of network controllers and terminals.

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MIS Directors Love Us For Our Compatibility.

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'I'd Like You to Do a Memory Upgrade on This One.'

Emulator Gives Sales Reps Easy Access to Data

WORCESTER, Mass. — Norton Co.'a Abrasives Marketing Group (AMG), the largest revenue producer for this $1.3 billion company, is in the midst of a program to link personal computers at 19 district sales offices to the mainframe at company headquarters here.

It is a move that ultimately will help free 200 Norton sales representatives from a burgeoning paperwork load and provide them with up-to-the-minute market information.

Until very recently, said Kenneth F. Haskins, AMG'a manager of marketing information, the group was unable to accomplish this communications changeover without a costly investment in IBM 3270-series terminals.

A low-cost emulator would allow field representatives and district managers to communicate with the mainframe, accessing current sales and marketing data. "When you consider this communications capability in addition to the productivity-enhancing tasks the [IBM] Personal Computer does, it becomes apparent that this is a move in the right direction," Haskins said.

"We looked for a package for the Personal Computer to establish this link to the mainframe environment," he said. "We wanted to build a total communications network that would take us as close as possible to a paperless organization."

Micro-to-Mainframe Link

By equipping Personal Computers with a 3270-emulator so that they could communicate with Norton's mainframe, Haskins estimated AMG could eliminate up to three man-months spent on one task alone — preparing the unit's sales potential reports. It would free the 200 sales representatives from two days' worth of paper-crunching and provide another week that the staff can devote to in-the-field sales activity.

More direct access to the IBM mainframe also will allow sales representatives to control, analyze and interpret information on markets.

"Now, for the first time, we'll be able to allow people who should have access to current information to get it," Haskins said. "Retrieval will be eased considerably, and we'll improve our service capability, which is what this is really about. To keep business, as well as expand it in this economy, we have to be a leader in all aspects of productivity."

Being a non-data-processing organization, AMG believed "there had to be a way to control our own information and paper," Haskins said. "From a record-keeping and volume point of view, we were rapidly losing ground."

AMG began computerized information processing only two years ago, Haskins recalled, with the purchase of an IBM 5288 minicomputer. Still, there were problems. The group's marketing history file, for instance, contained over 5.5 million invoice-level data records of territories and accounts.

Realigning territories each month meant revising the history.

Each information project automatically meant volumes of paperwork and nonproductive time, according to Haskins. The field staff filed maintenance transaction forms, which went to keypunch, then back to the field offices for checking and correction and then back to keypunch again.

With Norton's markets changing rapidly, especially during the recession, delays in getting crucial marketing information to field managers translated directly into reduced responsiveness. Personnel in charge of maintenance files were compiling changes that were already months old. The marketing information department'a credibility was decreasing as the paperwork load piled up, Haskins said.

While the 5288 allowed AMG to computerize clerical support functions, the system lacked the mobility and flexibility to meet the DP needs of mid-line managers, marketing analysts and product managers, as well as the routine requirements of the field sales staff.

In one project alone — the potentials system — the paperwork took each representative out of the field for two days. The potentials report is a yearly compilation of sales prospects, sales projections and marketing trends for each of the hundreds of customers. The Personal Computer offered possibilities, not only for tasks it performed as a stand-alone system, but also as part of a network.

An asynchronous communications configuration helped AMG get off the ground, Haskins said, but the data transmission speed was too low. There were other delays associated with physically downloading from the mainframe and mailing the diskettes to each office.

"We were looking for the right

(Continued on SR/10)

Is your most productive asset all washed-out?

Look at it this way.

If you had to squint to focus on washed-out screen characters. Hour after hour. Just how efficient would you be?

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A difference you can see.

Talking Terminal 'Speaks' Via Voice Synthesizer

SOUTH LONDON, England — When Worsley's, a local wholesale paper merchant, planned to streamline its headquarters sales office operation, it had one extra problem to overcome.

Mike Worsley, a member of the family and a key figure in the sales office, is totally blind. So the system development team and the company's consultant, Stewart Olrod, decided to develop a "talking terminal" using a voice synthesizer and some special software.

Each sales office position in the headquarters has a terminal attached to a Datapoint Corp. Attached Resource Computer (ARC) local-area network. But at the workstation, in addition to the display on the CRT screen, key words relating to each sales transaction are spoken by means of an electronic voice synthesizer that sounds remarkably human.

'Talking Terminal'

With the voice synthesizer and the controller software, Worsley's workstation is a "talking terminal."

(Continued on SR/12)

Emulator Ties Micros, Mainframe

(Continued from SR/9)

tools," Haskins recalled, "which is where the Personal Computer came in. The first application was electronic spreadsheets, which gave our analysts, forecasters and product managers some real productivity gains."

But the field representatives were still stranded on the paper mountain. Theoretically, each district office functions as a small business, but "we couldn't give each one a 5288," Haskins said. So they looked at the Personal Computer for several functions:

- To reduce paperwork and paper in storage and keep a better handle on customer information.
- To improve support for the district offices by making information available more quickly.
- To enhance Norton's image with distributors and customers, as well as prepare the district offices for future information and communications requirements.

After testing other emulator systems with unsatisfactory results, Norton AMG chose the Blue Lynx 3270 emulator, developed and marketed by Techland Systems, Inc. of New York. After the system passed extensive testing by Norton's Information Systems and Services Division, the company decided to buy 50 Blue Lynx systems from Techland.

AMG tested other IBM Systems Network Architecture communications packages before trying Techland's Blue Lynx, Haskins pointed out, but the others "didn't handle full printer support and uploading and downloading of files very well. We had the communications link, but we didn't have anything that was technically functioning to our needs," he explained.

AMG had previous experience with a Techland software product, the Shoebox Scheduling and Expense Reporting system, which also became a standard offering in the district office package.

Haskins said that the high level of support and willingness to modify Shoebox to fit Norton's needs encouraged him to try Blue Lynx.

So far, the results with Blue Lynx have been very encouraging, Haskins said. "Installation was accomplished in a matter of minutes; we just put in the board and ran the configuration."

Marriage of Voice and Data on Screen

The Emergence of the Integrated Workstation

By James H. Morgan
Special to CW‡

Where is the best location to integrate voice and data?

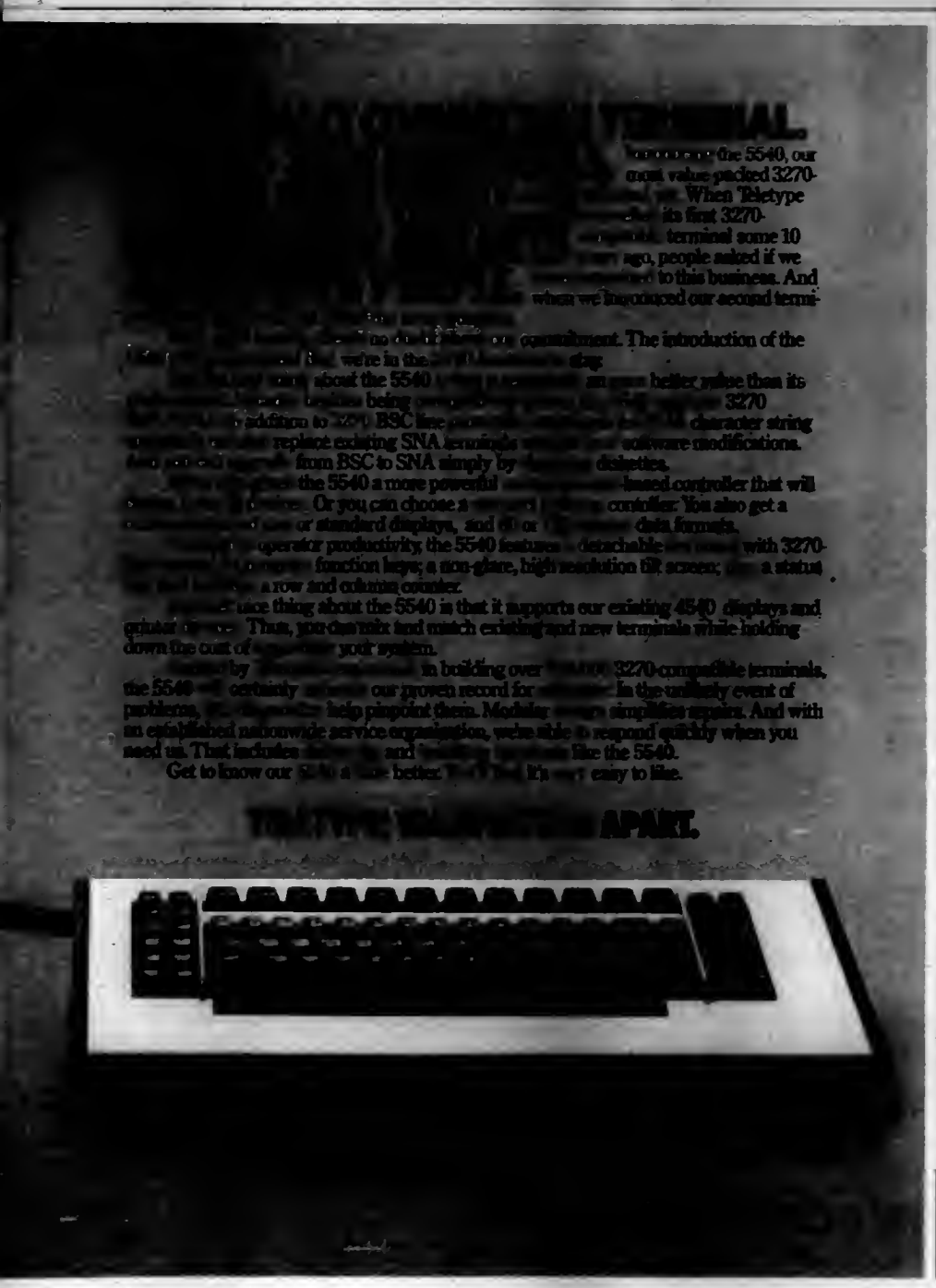
The answer is — as close to the vocal cords as possible, and that means the telephone set. Somewhere down the line, voice is going to be digitized to look like data, so why not digitize it right now?

One of the hottest buzzwords today is "integrated voice/data." Engineers have been developing this concept for decades. Resulting products have been installed for years by common carriers and sophisticated business users in their transmission systems.

Now we see integrated voice/data coming right into business offices, into digital private branch exchanges (PBX) and right onto desks. The term "voice/data" is shorthand for voice/data/word processing/message/facsimile/electronic mail/personal computers/video/environmental control/security and so on.

Why is this happening? Why are telephones beginning to be seen with keyboards, CRT screens and printers attached? Is it to provide engineers with more devices to play with and provide salesmen with more flashy devices to sell? The answers are yes and yes, but more important, this voice/data integration provides users with some real benefits, including communications

Managers are being encouraged to use the term "workstation" to replace the word "desk" and, similarly, to use "multifunctional terminal" to replace "telephone set."



Future Workstation

The workstation of the near future has been described by many people already. The workstation will provide, at one location, access to a number of functions that assist employees in performing their jobs better.

These functions include telephone, message, word processing, electronic mail, facsimile, data processing, data entry and retrieval, voice store and forward, video teleconferencing and the like.

Real benefits accrue to both managers and their staffs. The manager now has considerably more flexibility in setting up operations. Workers can be more versatile and perform more functions. Operations can be streamlined. Special projects, such as sudden heavy work loads in one area, can be handled more quickly and smoothly. As a result of all this, worker productivity will rise significantly.

Employees will also benefit. Their morale and job satisfaction will increase. They will enjoy the broadening of their functions. The tedium of a narrow job can be relieved. Employees will see jobs all the way through, not just be links in a chain.

An example illustrating this might be the transmission of an executive report. While remaining at one workstation, a secretary can:

- Type the cover letter in rough draft on a CRT and have the executive review it (typing).
- Modify some wording for the final cover letter (word processing).
- Retrieve the executive report and perhaps some reference material from electronic storage as an attachment (information retrieval).
- Add brief verbal comments by the executive (digitized voice store and for-

(Continued on SR/14)

Mike Worsley using a Datapoint Corp. terminal.

Paper Firm's Talking Workstation Lets Blind Employee Hear Prompts

(Continued from SR/10)

With his talking terminal, Worsley hears the workstation prompts and responses instead of seeing them on the screen. The customized terminal allows him to function like any other member of the sales office staff. Worsley's voice, familiar to customers across the country, is heard as usual on the telephone.

When customers call, he discusses their requirements and enters the order via the keyboard on his talking terminal. At his workstation, the computer responds verbally with the necessary information to enable Worsley to make the sale. When Worsley types in an OK command to the computer, the system executes the order, prints the dispatch note and confirms it to Worsley by voice.

Worsley's business as an inter-merchant trade house — one of the largest in the country — involves stocking over 7,000 items of paper and board of every conceivable weight, texture, color and size.

Worsley's customers consist of smaller merchants located across the country and end users such as printers, publishers and in-house offset departments.

All Worsley's customers have the same needs: The paper they require must meet their exact specifications, and timely delivery is of the essence. More than 1,000 individual orders are processed at Southwark every day.

Ordering is traditionally done by telephone, and the nerve center of Worsley's is the sales office headquarters with 30 telephone lines manned by sales executives. Via terminals on each desk, the sales executives have access to customer addresses, current stock levels, credit ratings and other data necessary to complete and record each transaction.

If necessary, a record of this data also can be printed at any one of the several printers attached to the local network. The local network system replaced a card index system that had to be referred to and updated manually for every inquiry and order by each salesman.

Financial director John Worsley began a study of the available computer equipment to improve response times and internal sales office clerical procedures in 1981. He chose the Datapoint system because of its modularity.

Specially written software was produced by Olrod. Functions included so far are inventory, customer files and order history, dispatch notes and invoicing and management reports. A further development planned for the future will include minimum stock-level analysis and automatic reordering.

The Worsley system consists of 32 terminals, seven advanced business computers, four disk storage units and five printers interconnected to form a local-area network.

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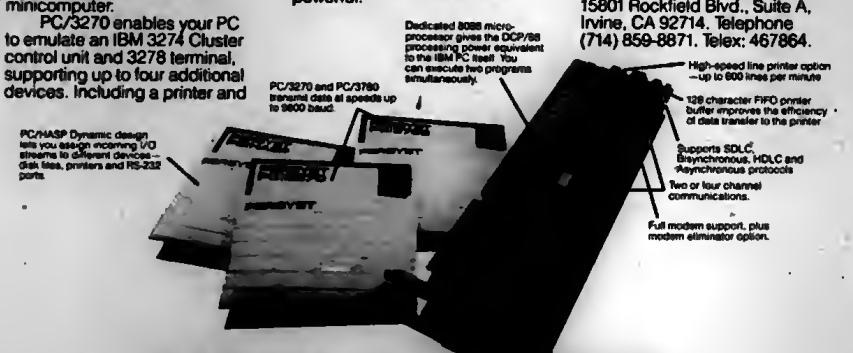

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Combine complete 3270 system-compatibility with an innovative Lee Data design and you have a System that delivers greater convenience and flexibility.

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The Union of Voice and Data in the Work Place

(Continued from SR/11)
ward).

- Electronically transmit this information across the country instantaneously through a digital PBX switch that provides universal access (electronic mail).
- Electronically file the transmitted information package into local electronic storage (data entry).

During this time, the secretary can simultaneously make and receive regular telephone calls.

This convenient, efficient and more productive operation relies on all information being digitized and integrated right at the workstation with its multifunction communicating terminal.

Most readers are aware of digital PBX switches that are housed on company premises. Since 1974, over 15,000 of these switches have been installed, mostly via interconnect (nontelephone company).

Analog voice is first converted to digital form using coder-decoder devices, and then the resulting digital signal is switched through the PBX's digital matrix to the dialed destination.

For the time being, while common carriers are still mainly analog-oriented, a reconversion back to analog is usually performed by the digital PBX, but this is only a temporary condition, rapidly changing as advancements are made toward the all-digital world.

All the new digital PBX entrants (second-generation digital PBX), like those offered by Intecom Corp., Lexar Corp. and AT&T Information Systems, Inc., now offer for the first time the option of digitizing voice right inside the telephone set, via a large-scale integration coder-decoder chip. And some first-generation digital PBX manufacturers are beginning to offer the same as upgrades.

Major Breakthrough

This coder-decoder in phone is a major breakthrough for accelerating the move toward the automated office and achieving the benefits described above.

The reason is that all signals emanating from the desk, or workstation, will now have the common denominator of being digital. This means that within a few inches of a person's vocal cords, all kinds of signals can be integrated together (time-division multiplexed) and thereafter travel over the same wires and other communications facilities in digital form.

For example, several digital PBX manufacturers provide speeds of 128K bit/sec over two pairs of copper wires to carry simultaneously voice (64K bit/sec), data (56K bit/sec) and control (8K bit/sec) from the workstation to the digital PBX. There will be fewer separate layers of building wiring for the numerous applications.

Instead, layers will be wiring type, namely copper pairs, coaxial baseband, coaxial broadband and fiber optics up to an eventual maximum of four layers. Costly rewiring will be minimized. Employees need not run down the hall to access presently separate systems.

What types of desk phones are actually being offered today with these capabilities? There are electronic telephone sets with RS-232 data jacks in the back for plugging in CRT terminals and printers. There are CRTs with keyboards that have telephones added on the side.

Over six digital PBX manufacturers have announced such combinations, and several now have working installations. And there are other schemes for integrating the digitized telephone signal with other digital signals at the desk. The tele-

(Continued on SR/16)

CRT Industry: Its Changing Face and Market

By Mike Henderson
Special to CW‡

The CRT terminal industry has been in a constant state of flux for the last 10 years as manufacturers have added more features to terminals and at the same time brought down prices.

The trend continues today and is being shaped by three emerging issues, the IBM 3178, the personal computer and the Unix operating system.

The 3178 is simply a continuation of a trend that started with the IBM 3278 and the plug-compatible manufacturer (PCM) terminals that sold for less; for example, improved technology made it possible to build a functional 3270 terminal for a lot less money.

'Personal computing is a better way to provide processing power to individuals than shared logic systems.'

The 3178 is certainly not the end of this trend, although other factors may make it the end. It costs IBM about $500 to manufacture a 3178 today, and this cost will decline with time. Looking at technology and low-cost production methods used by the glass teletypewriter (TTY) manufacturers, it should be possible to build a PCM 3178 for about $350 in quantities of 100,000 (including material, labor and overhead allocation).

However, it is one thing to manufacture terminals and quite another thing to sell them. The teletypewriter manufacturer's channels of distribution are generally not well suited to selling into IBM installations, giving IBM a distinct advantage.

Another problem, which is a result of declining costs, is the decline in the absolute dollar difference in cost between the IBM terminal and the PCM terminal. When terminals were expensive, a 20% difference in cost was significant.

As cost comes down, a 20% difference in cost is not many dollars, and customers may pay the extra money for IBM's selling and service power. The CPU memory market is an example of this phenomenon.

Most PCM terminal makers will be offering a 3178-type terminal, but in the long run, their success depends upon their ability to offer much more than 3178 features.

This leads to the next issue — the success of the personal computer in the business environment. This is a trend with major implications to business and the terminal market. Personal computing is a better way to provide processing power to individuals than shared logic systems, but personal computing has two inherent weaknesses.

Business depends on shared data, and the personal computer by definition is a stand-alone system. Second, the present operating systems for personal computers are painfully primitive. Apple Computer, Inc's Lisa workstation appears to be better, but the cost of the unit is prohibitive. Operating systems will, however, continue to improve as memory cost goes down and processing power increases — so this objective should go away with time.

The problem of shared data is more difficult to address and calls for a system solution. The software application in the personal computer must be able to access a central file (or data base) sys-

(Continued on SR/16)

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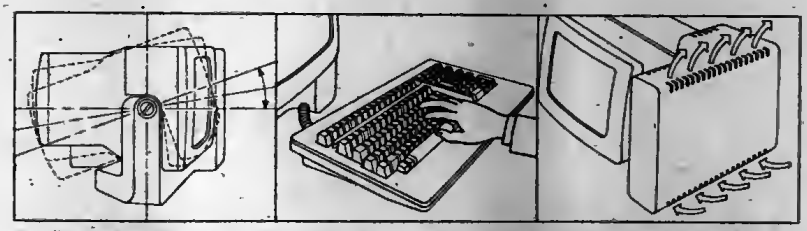

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The CRT and Its Changing Role in the Industry

(Continued from SR/15)

tem to retrieve data in a completely transparent manner to the end user.

This means that the operating system in the personal computer and the software in the central file system must be coordinated and, in the absence of standards, this generally means that they must be supplied by the same manufacturer. This implies that manufacturers that only supply personal computer hardware and software will eventually lose out in the business market to those who can solve the system problem.

Another advantage of the system solution is that the personal computer cost to the end user can be reduced somewhat because the bulk file storage can be done at the central file system, and printing can be done on a shared printer. These are minor advantages that only become important in certain configurations.

The effect of the Unix operating system on the terminal market is primarily dependent on Unix being used as a multiuser (shared logic) system. It is certainly possible to use Unix as a single-user system, but it would then be lumped into the personal computer category. The advantage of using Unix in a business environment comes from the standardization of the operating system.

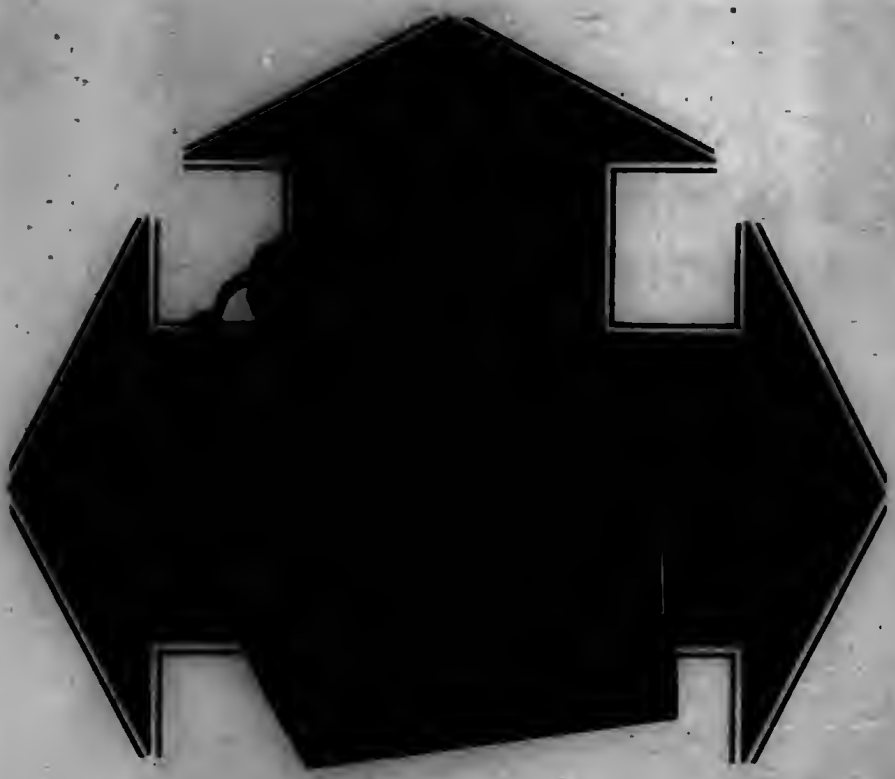
Business users believe that software houses will see the Unix market as a large opportunity and will produce a wide variety of software.

The problem with Unix, from a terminal point of view, is that the Unix structure implies a dumb TTY-type terminal operating in character mode. Unix software can be written to use line mode or block mode, but if the system manufacturer is to be general, he must also support the character mode of operation.

Character mode of operation prevents the manufacturer from offloading the shared logic processor with the terminal processor and thus limits the capability of the shared logic system.

Communication between

(Continued on SR/18)



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Created by Daymon/Hall, Inc., Winter Park, Florida

Voice/Data: Its Union In the Office

(Continued from SR/14)

phone set is being transformed into a multifunctional terminal.

This article mainly discusses the major role of the digitized telephone set and its host digital PBX in providing the integrated communicating workstation. This is a form of a local-area network. Another form of a local-area network coming on strong is the packetized local-area networks, typically coaxial, such as Xerox Corp.'s Ethernet.

Packetized local-area networks that today carry data, but may soon carry voice, will sometimes compete with digital PBX systems; however, it is more likely that they complement them.

A user must recognize that workstation functions can be served by several types of cables (copper pairs, coaxial and soon, fiber optics), depending on the user's particular voice/data applications. At this time, however, the digital PBX is generally considered the more likely candidate for becoming the office controller, with various packet local-area networks feeding into the digital PBX via gateway interfaces.

Morgan heads the independent consulting firm of J.H. Morgan Consultants in Morristown, N.J. This article is excerpted from his two-day on-site seminar titled, "Digital PABX, Integrated Voice/Data and Interconnect."

With Terminal System

Bank Cuts Document Processing 33%

C&S' Clyde Jennings

ATLANTA — Citizens and Southern National Bank (C&S) here recently took a major step toward reducing the cost of processing the millions of checks, deposit and withdrawal slips and other pieces of paper generated each day by customers of its more than 190 branches throughout Georgia.

After almost 10 years of research and development in the area of paper truncation, the $6 billion-asset bank implemented an on-line electronic transaction recording and accounting system at one of its business branches here. The system eliminates the need for the bank's proofing department to process as much as 33% of the branch's paper transaction documents at the end of each business day.

"Initial analyses of the results at our pilot branch indicate that we will be able to truncate almost six million items per month at our 86 Atlanta branches alone using this new system. When we extend paper truncation bankwide, that pile of unproofed paper could grow to between 10 to 12 million items per month," stated Clyde Jennings, the C&S assistant vice-president who has been in charge of the bank's entire branch automation effort.

Under the new system, the transaction data contained on all checks, savings account deposit and withdrawal slips and other types of documents normally handled by tellers — except transit checks and large commercial deposits — is captured electronically by the tellers as they enter those transactions into their on-line terminals.

Each transaction is automatically balanced and proofed by the system as it is entered, and the data, in the form of debits and credits, is stored on magnetic disks at the branch for subsequent transmission to the bank's host computer for overnight application to its accounting system and general ledger.

At the same time, transactions affecting savings account balances are applied to a memo post file in the host computer, designed specifically to maintain accurate, up-to-the-minute account balance records that are also used to update host computer files overnight.

According to Jennings, the paper truncation system represents a new concept in on-line teller transaction processing with electronic journaling technology and a specially developed host computer accounting system that enables time deposit transactions to be processed in exactly the same manner.

"In effect, we are able to treat all transactions, except transit checks and complex commercial deposits, simply as either debits or credits for teller cash control and basic accounting purposes," Jennings said. "We are now able to record all transactions electronically at the teller terminal and pass many of them directly to our accounting system without the need to sort and proof the paper relating to them at our operations center," he reported.

Depending upon each day's mix of business, this will result in a 30% to 40% reduction in the nightly work

(Continued on SR/18)

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ComDesign's multiprocessor architecture provides extraordinary throughput and fast echo. The dual data link option brings the added security and efficiency of a second composite link. And TC-500 monitoring and diagnostics, with visual display of channel data, EIA signals, error counts and utilization [illegible]

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Paper Truncation System Speeds Processing

(Continued from SR/17)

load of the bank's proofing department, once the system is put into full operation throughout its branch network later this year, Jennings added.

While most checks, deposit and withdrawal slips and other documents are not delivered to the bank's proofing department, they are photographed each night by an IBM 3083 microfilming system, as they have been in the past.

In addition, the transaction-identification numbers generated by the system must be related overnight to the microfilm frame numbers of the documents involved in that transaction so that photographs can be quickly and easily copied and retrieved whenever required, noted J. Robert Almand, a C&S assistant vice-president from the bank's data processing department.

One of C&S National Bank's Bunker Ramo Teller Terminals

"With the exception of one file-merge computer run to combine transaction and microfilm identification numbers, the new paper truncation system doesn't require any additional use of our computer capabilities," Almand observed.

C&S began its paper truncation efforts in the early 1970s, when it entered into a joint development effort with SCI Systems of Huntsville, Ala., to design and produce hardware and software that was tested for a full year in an eight-teller C&S branch.

"That system actually worked. We reduced the paper from that branch going to our proofing department by 34%. However, for a variety of reasons, we decided not to implement that system bankwide at that time," Jennings reported.

But in the late 1970s, C&S decided to go bankwide with its paper truncation program by inviting SCI and others to submit hardware and software proposals for an on-line branch teller system that would achieve its paper truncation goals, as well as handle on-line account inquiries and transaction postings.

After months of evaluation, C&S chose an on-line teller and electronic journaling system for installation throughout its branch network from Bunker Ramo Information Systems.

C&S began installing its on-line teller terminal system in January of 1982. Although four of its branches have yet to be converted, all other

(Continued on SR/20)

MITRON'S STD 1600 Simplifies Data Transfer By Communicating Off-Line Tape-To-Tape

Mitron's STD 1600 provides an efficient method for sending and receiving data anywhere in the world. STD 1600s communicate with each other and with other companies' bisynchronous terminals and computers.

The STD 1600 solves machine compatibility problems. It transfers data reliably without mailing tapes. It can communicate off-line to relieve an overworked computer.

STD 1600s transfer data at speeds up to 56KB. Double-buffering eliminates delays caused by read/write cycle times.

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Issues Shaping CRT Industry

(Continued from SR/16)

the Unix system and a remote terminal is also a problem, requiring one logical line per terminal (one physical line may be multiplexed to several logical lines). The speed of the communications line and any delays, such as through a packet network, may make some applications unusable.

As an example, consider a word processing application running in Unix where the application must decide on display adjustments as each character is entered (as in word wrap, columnar functions or even cursor position). If the user can enter characters faster than the application can echo and adjust the screen, the application will be essentially unusable.

The only way to solve this problem is to change Unix to work only with block-mode terminals or to establish a new standard where part of the Unix system and application is loaded into the terminal.

A resolution of this problem can only be achieved through sponsorship by a strong manufacturer, a position that Bell Laboratories does not seem to hold today; it would be unimaginable for IBM to support a product produced by its future competition. For the foreseeable future, it appears that Unix will assist in driving the market for dumb asynchronous TTY terminals.

In general, units without personal computing appear to be falling in price while a separate trend is toward more powerful processing units. The 3270 and TTY markets will become very price competitive, while other manufacturers will try to add additional system functions to improve their profit margins.

Henderson is director of product planning at Paradyne Corp. in Largo, Fla. He is primarily responsible for defining new network and terminal products to be used in teleprocessing environments.

In $6 Billion OA Market

OCR Nets Seen Alternative to Clustered WP

Herbert F. Schantz
Special to CW‡

In 1979, the office automation market in the U.S. was estimated to be $1.1 billion. In 1982, it was forecast to be $3.3 billion. Over the six-year period from 1979 to 1985, it is expected to grow 33% each year and exceed $6 billion by 1985.

The segments for this market consist of stand-alone and clustered word processing systems, intelligent electronic typewriters, intelligent copiers and printers, facsimile and teleprocessing systems.

The largest market segment is word processing, which accounts for approximately 81% of the total market from 1980 through 1985.

Clustered word processing shipments are expected to increase from approximately $142 million in 1979 to $2 billion in 1985. This is a compounded growth rate of over 50% per year and makes this market segment one of the fastest growing areas in the office automation business.

It is in this area that optical character recognition (OCR) networks and other automation technologies can be used as alternatives or supplements to data communications terminals.

Cost-Effective Equipment

In recent years, many aspects of automated data processing have become cost-effective. Automated business equipment, such as OCR scanners, are an example. While the cost of more efficient and more versatile hardware has been decreasing, the productive capability has been increasing.

Data processing hardware costs have declined 15% per year since 1977. During this same period, overall DP costs have increased by 14% annually. Part of the reason for this cost increase is due to the labor intensiveness of data entry. The mechanical transfer of data via manual key entry is both expensive and time-consuming.

A comparison of data processing estimates from 1960 to 1980 very clearly illustrates this situation. During these two decades, the cost to process one million cycles of information has dropped from $40 to four cents. The cost for storing one million bytes of information for one month has declined from $64 to $1.60. However, the cost to enter manually one million characters of information has risen from $302 to more than $650.

The conclusions of a recently published survey indicate that data entry represents from 10% to 25% of total data processing budgets.

The time to address this problem is now; it will remain with us as data entry requirements grow. A major part of the solution can be found in the wider and more productive application of OCR networks. OCR is now accepted as a mature technology with a proven track record of cost reduction in the highly labor-intensive area of data entry.

OCR is a primary reason why significant productivity gains are being experienced in today's data entry operations. Data processing managers who are currently using OCR data entry systems and are reaping the economic benefits from OCR realize that data entry no longer needs to be the weak link or input bottleneck in their DP operations.

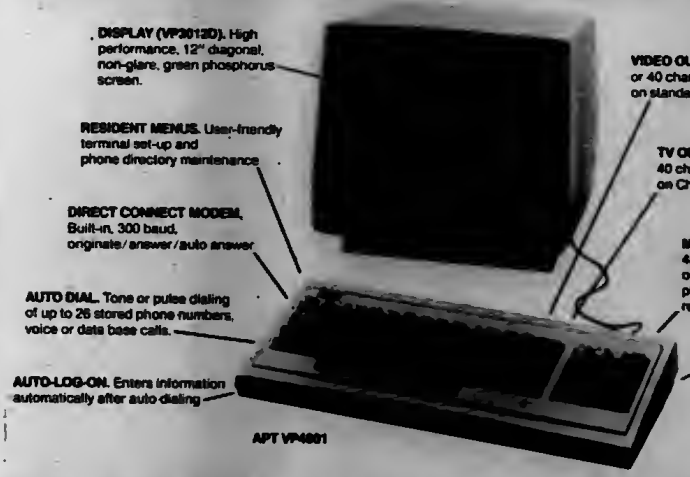
OCR's emergence during the past 20 years may be regarded as one of the most significant improvements in business productivity since the invention of the typewriter a century ago. The evolution of OCR from its early history — when one-of-a-kind products were painstakingly manufactured to help meet customers' highly specialized needs — to today when OCR is being coupled with other state-of-the-art technologies such as image processing and integrated communications, has helped to form complete, multifunction system networks.

'OCR's emergence during the past 20 years may be regarded as one of the most significant improvements in business productivity since the invention of the typewriter a century ago.'

These systems combine unique hardware architecture and software flexibility to provide multifunction capability that is applicable to both batch and transaction data entry. Systems of this type are also adaptable to source data capture with total data entry via on-line error-correction

(Continued on SR/26)

You don't need a computer to talk to another computer.



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For business, professional and personal data communications, you'll find more user-friendly features and greater communications capabilities in the RCA APT than in other terminals selling for up to three times the price.

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OTHER FEATURES

RS232C port for direct computer connections at data rates to 9600 baud, or for connecting high speed modems and other accessories. Parallel printer port for hard copy. Numeric keypad, can dial phone numbers not in terminal directory. Built-in speaker with adjustable volume control for audio monitoring of phone line. Smooth scroll display. Automatic screen blanking to reduce possibility of burn. Briefcase size: 17" x 7" x 2". Weight: under 4 lbs.

Quite simply, matching features with price, there is no other professional quality terminal available today that can do as much at such low cost.

APT terminals list for $399, in your choice of full stroke or membrane keyboard versions. Either style is also available with a display monitor for $598 list. The data display monitor alone, VP3012D, $229 list.

For more information—or to order—call 800-233-0094. In Penna., call collect to 717-393-0446. Or write for fully descriptive brochure to RCA MicroComputer Products, New Holland Avenue, Lancaster, PA 17604. OEM and dealer pricing available. The new RCA APT. Expansive. Not expensive.

APT VP3801. Flexible membrane keyboard version designed for travel and hostile environments.

RCA

Portable Unit Helps Insurer Expand Services

FORT WASHINGTON, Pa. — When Lang Dixon opened his own insurance agency in 1976, he invested in a portable computer terminal to provide financial and estate planning services at the homes and offices of his clients.

His computerized approach was especially applicable for serving the personal and professional requirements of the physicians who constitute 95% of his clients.

Estimating that he ended 1982 by writing $5 million in insurance, Dixon expects to write $7 million in 1983.

"Because of the company's computer system, I am able to work with informed consumers with sophisticated financial needs, and I am able to get commitments on the first interview that I ordinarily would not be able to get," Dixon said.

Dixon, a general agent for General American Insurance Co. of St. Louis, runs Lang Dixon and Associates, which is located here.

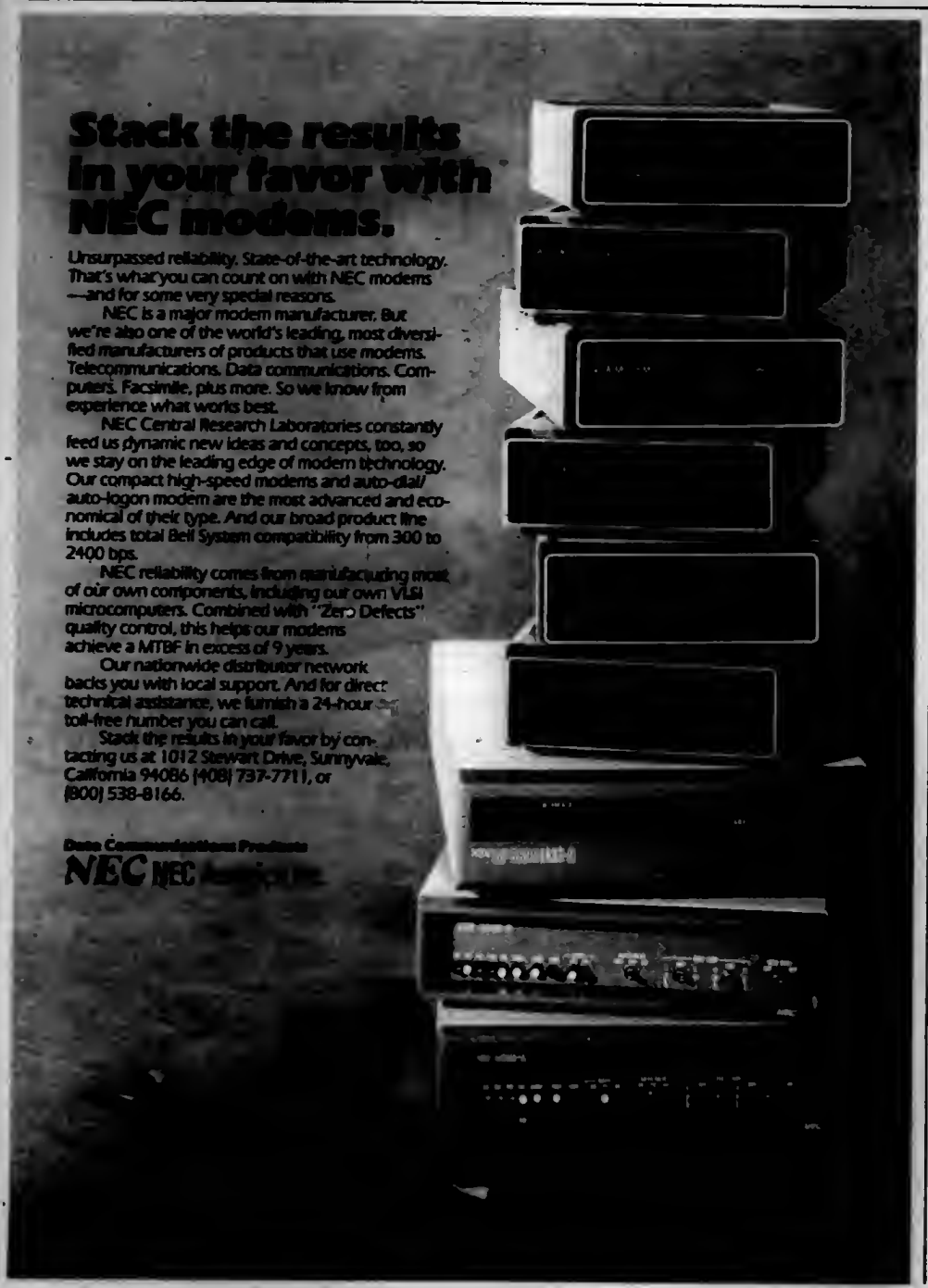
Dixon said he is readying a wider range of services, including real estate analysis and syndication, as well as equipment leasing and purchasing information that may be supplied, for example, to a physician's accountant and attorney or to a businessman. All will be based on calculations performed at his terminal.

"My clients are becoming still more sophisticated," Dixon said, "more aware of tax shelters and products such as Universal Life insurance. The insurance industry is coming to a one-stop 'supermarket' approach — combining estate planning, tax shelters, investment, insurance and other services under one roof.

"Using the computer system enables me to expand my services competitively so that the client thinks of me as his financial center and adviser," Dixon said.

Dixon uses the SST computer terminal made by Computone Systems, Inc., an Atlanta-based company that provides financial planning and life insurance policy information services.

(Continued on SR/22)



Accounts Aid Helps Bank Process Paper

(Continued from SR/18)

branches were converted exactly on schedule, Jennings reported.

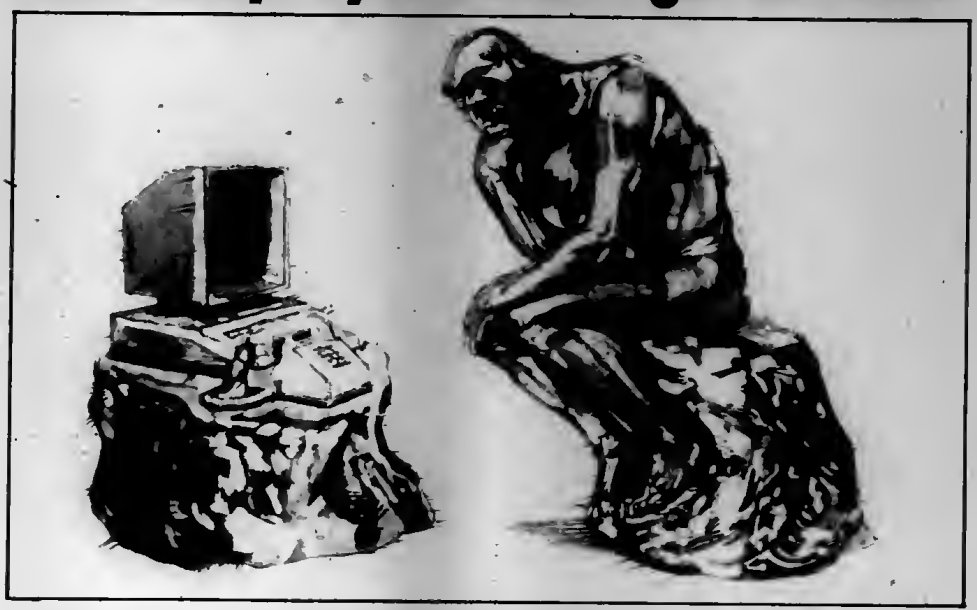
The on-line system was extremely important to C&S because it wanted to treat its transactions differently from most banks, in terms of the way tellers enter data into their systems. Almost all such on-line systems currently at work in the nation's commercial banks treat each transaction, such as a deposit or a savings account withdrawal, separately.

Thus, if the same customer wishes to cash a check, make a withdrawal or make a payment to a credit-card account, each transaction is entered separately by a teller and processed separately by the bank's host computer overnight.

At C&S, however, tellers treat each customer as a transaction, and each deposit, withdrawal, payment or other transaction is treated as a single item. Tellers at the pilot C&S branch and, ultimately, tellers throughout the bank's branch network, can combine up to seven items into one customer-related transaction, with each transaction treated as either a debit or a credit.

These debits and/or credits must balance out before the transaction will be accepted by the system, ensuring both accurate teller cash control and accurate electronic transaction recording and accounting.

All the great thinking in the world won't help if you haven't got the facts.



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Firm Aims for Simplicity in Choice of Monitors

LONG BEACH, Calif. — Simplicity was a key factor in the selection of a data communications monitor for Eastman, Inc. here, one of the largest retail and wholesale office supply companies in the U.S.

That was the word from John Mitchell and Gus Brocksen, principals in the Ultimo Corp., a consulting firm here that guided Eastman through its recent conversion from the use of a local service bureau to the acquisition and installation of its first in-house computer system.

The decision to provide customers with on-line terminals using dedicated and dial-up lines and to provide the Eastman sales force with handheld bar code scanner terminals prompted the firm to switch to an in-house facility.

The addition of these 30 new terminals, however, brought with it the need for a data communications monitor that could handle a complicated communications network without an extensive data processing staff and at a reasonable cost.

After a two-week trial period using IBM's CICS, Eastman switched to Atlas, the data communications monitor developed by Mathematica Products Group, Inc. of Princeton, N.J.

"We never fully installed CICS at Eastman," Mitchell said, concerning Ultimo's involvement in the selection of a monitor for Eastman. "There are a lot of 'bells and whistles' on CICS that complicate the system. Within two weeks, we realized it would require a systems programmer just for CICS, making it difficult for Eastman's limited number of data processing personnel."

Eastman now supports 39 direct and six remote terminals along with six printers using the new communications software on an IBM 4331 Model K-11 under DOS/VSE. Atlas was installed by the vendor and a contract programmer, Colin Cook of Programming Applications, Inc., in one eight-hour day.

All 130 Eastman applications were converted within three days. A significant consideration for Eastman, as for most other companies, was cost. "We figured that we saved Eastman about $40,000 annually, or the cost of a systems programmer, by rejecting CICS," Mitchell said.

In addition, the Ultimo team noted Eastman's ability to acquire the

(Continued on SR/26)

Terminal Spells Success for Agent

(Continued from SR/20)

The company has an extensive data base of over 4,000 life insurance companies and an applications library of more than 660 financial planning and policy illustration programs. All may be accessed on a time-sharing basia via a telephone.

The SST is portable and specifically designed for use at the "point of sale," a client's home or office. Built into an attache case and weighing 18 pounds, it includes a telephone modem and a dot matrix printer. Preprogrammed plug-in computer circuit boards called Program Pacts enable the SST to operate as a stand-alone computer.

"The terminals are phenomenal point-of-sale selling tools," Dixon said. "Whether in the board room or living room, they make it easy for the consumer to make intelligent decisions and understand what they are buying. Financial planning is a complex subject that the terminals reduce to numbers, bottom-line reports geared for simplicity," he noted.

First Interview

During a first interview with a client, Dixon conducts a basic financial analysis of assets and debits, including savings, salary, loans, real estate, stocks and bonds, income and capital gains taxes and estate taxes to be paid at death, as well as the inflation rate. He enters all the information into the computer, which then calculates the amount of income needed by a client and his family if disabled, at retirement and at death.

He then presents these calculations to the prospect. "Ninety-five percent commit on the first interview after seeing their financial needs," Dixon said.

At a second interview, he presents a report detailing auch subjects as capital needa and objectives in the event of premature death, living objectives and projects liabilities and assets into the future using various interest rates.

The report includes specific recommendations for wills, individual or corporate trustees and compares different insurance plans and coverages.

"The Computone system reduces the number of interviews needed, which makes me more productive," Dixon said. "I can see more clients, spend more time with them and deliver a proposal immediately."

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Bypasses Politics, Goes On-Line With City

City's DP Center, Library Join in Automation

SHEBOYGAN, Wis. — This city's data processing department and the local Mead Library have bypassed politics and have jointly designed and implemented an automated library circulation system.

According to John Moyer, director of DP for the city, the library shares in the on-line use of the computer along with all other city departments, schools and transit 24 hours daily, seven days a week.

The initial conversion effort required approximately eight months to enter all book detail and patron data into the computer, with 10 operators working two shifts, the key being an eight-digit accession number prefixed with a "D." During this entry period, DP printed the accession number on gummed labels in Ocra font, which was in turn affixed to each item.

Next, plastic patron cards, also in Ocra font, were printed and distributed to the patrons when they came into the library. Special CRT terminals were set up to minimize any waiting. Also, at the same time, the data in the patron record was updated if required. Preceding the actual cutover, all library personnel participated in a two-month training session in which books were checked in and out, held for being overdue and paid off. Also, power was turned off so the personnel could receive training in backup procedures, according to a city spokesman.

Communications Front End

The CPU, an NCR Corp. 8565, is configured with a communications front end. The library is connected to the computer via leased lines using Recognition Equipment Corp. Ocra Wand Readers and CRT terminals. A backup Bell system Comstor unit is also connected to these same units. In the event of a main computer failure, the library will continue in business, recording data on the Comstor for later transmission to the main computer, a city spokesman said.

The system provides for on-line maintenance to patron files, book inventory files, overdue inquiry, payment of fines and inquiry on borrowed books; checks books out and in; sets up reserves; and performs other functions. Other programs provide overdue listing with all patrons and books listed by days overdue and amounts of fines.

In addition, invoices — including cost of book, fine and fees — are issued on 10-, 20- and 30-day cycles. Circulation statistics are provided

(Continued on SR/26)

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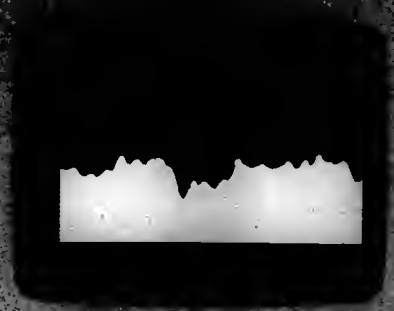

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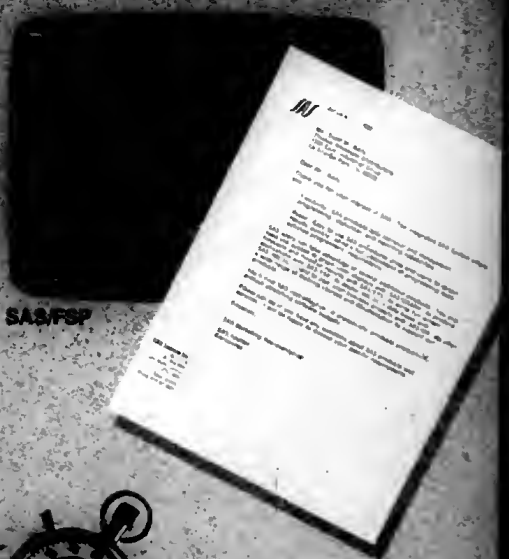

Library, DP Center Join to Automate Circulation

(Continued from SR/23)

daily by number of books, by type of patron and by ½-hour increments during the hours the library is in operation. The same type of statistic is provided by Dewey and Cutter numbers. Geographical listings also assist the library management in knowing where patrons are from and the type of book they are reading, a city spokesman said.

On-line storage requirements for the library are slightly in excess of 500M bytes, including all files and programs.

By far the largest amount of space is used in defining the approximately 400,000 books, which includes magazines, periodicals and films.

This effort has paid off in several areas: faster and more accurate fine collections, reduction in lost or missing items, increased speed in checkout handling, immediate access to patrons with overdue books and immediate processing of reserve books when placing on or removing from reserves.

Statistics are also available that show the types of books being read by the public, which should help management in deciding which items should be stocked and/or removed.

Plans are now under way to provide for automated purchasing of books via a leased line to publishers' computers and for automated subject files for patron use, a city spokesman said.

The system, although designed for one central library, is easily adaptable to multiple libraries and/or branch libraries. The costs to the library are a fraction of what they would be if the library maintained its own computer center. The city benefits also in that the data center equipment is more powerful than could be supported without the library.

Simplicity Played Key Role

(Continued from SR/22)

software on a one-time cost basis, as opposed to the CICS continuous monthly rental fees, as a plus for the company.

The switch prompted Eastman to add a number of new applications, as well as include the order entry program for customers and sales representatives from remote terminals, explained Eastman's vice-president of finance, Ruben D. Recio. Response times have also improved, Recio said.

"The conversion from the use of a service bureau to our in-house system was very efficient," Recio said. "In fact, it was without incident. The software requires no specific hardware options to run, no preprogramming and no operator intervention."

"For any company seeking a data communications monitor," advised Mitchell and Brocksen, "the most important factor should be simplicity. Even though there is little difference in writing applications with one product or another, there can be a substantial difference in maintenance of those products. Simplicity translates to bottom-line dollars."

Office Automation Market Forecast to Grow 33% Yearly

(Continued from SR/19)

features These systems combine high-performance microprocessors with broadband user-friendly software.

A network of terminals and OCR equipment can be configured to transfer data at extremely fast rates exceeding 6M bytes per second. The local network of OCR and computing stations can use existing telephone wiring in the office for interconnecting stations up to two miles away.

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Schantz is a vice-president of Graham Magnetic, Inc. in Fort Worth, Texas. He is the author of The History of OCR, *as well as numerous papers on OCR and information processing.*

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In Sprawling North Dakota

State's Finest Boast 'Best' Rural Net

BISMARK, N.D. — North Dakota is a sprawling, vast state of 70,000 square miles with approximately 620,000 inhabitants. Police officers are few and far between, thereby making it extremely important that communications be fast and efficient.

It wasn't too long ago that communications among the dozens of state, federal and local public safety agencies was a hodgepodge of VHF, UHF and low-band radio networks. Lyle Gallagher, director of communications for the state of North Dakota, who was a dispatcher for the State Radio Communications Facility at that time, remembers it this way:

"While we were set to handle something as unlikely as an atomic attack, we were not ready for 'real world' disasters — blizzards, floods, storms or tornadoes," Gallagher said. "We didn't even have a communications van which we could move into a disaster area to reestablish communications. We feel we now have the finest rural communications network in the world; people from all over with similar problems have come to see how our system operates."

The 'nerve' center is responsible for more than 1,200 users.

Gallagher's first task as director was planning. With 15 radio stations and towers in the network at the time, he looked at the cost of staffing each station as opposed to running phone lines out and controlling everything from here.

"Because the cost of staffing remote stations was prohibitive, we decided on using land-line and microwave," Gallagher stated. "We discovered that the state highway department had a network of 35 microwave control towers. Most police and medical networks were VHF. We needed new equipment, and the only money available was coming from federal funds — Law Enforcement Administrative Agency money."

In 1977, the department stepped into the Space Age. That was the day a new $2 million radio system went into full operation. It uses the latest in radio and computer technology, much of it designed specifically to meet North Dakota's needs and specifications.

"We combined maintenance staffs with the highway department and sold our old radio towers, moving into the highway department's 35 sites," Gallagher said.

North Dakota winters pose serious communications problems.

Each tower broadcasts on three channels — one a mobile radio channel into the state radio network, another a local and county law enforcement channel and a third a nationwide law enforcement channel.

Through the use of repeater stations and the advantage of statewide central dispatch, an officer in one corner of the state can communicate directly with another in the opposite

(Continued on SR/28)

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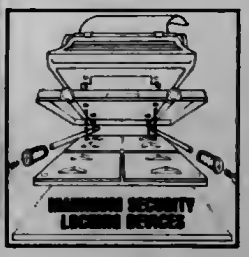

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North Dakota's Finest Boast 'Best' Rural Net

(Continued from SR/27)

corner by either radio or teleprinter.

"The statewide centrally dispatched communications network permits law enforcement officials to join forces in emergencies. Police officers, communicating by teletypewriters, can rush to each other's aid, mustering perhaps 100 officers in a county when needed," Gallagher said.

Law enforcement officers throughout North Dakota can be in direct contact with other police and sheriff departments all around the U.S. through the Law Enforcement Telecommunications System. This system enables them to type out a message addressed to any or all law enforcement agencies and receive a hard-copy reply from thousands of miles away as soon as the information is available.

The teletypewriter messages go through state radio, which monitors the traffic on the computer-based teleprinter system. This nationwide communication has proven to be a valuable tool in identifying suspects, stolen property and other pertinent public safety information.

As of November 1982, the North Dakota state radio network had 1,600 users representing 287 agencies — from the Bureau of Indian Affairs to the U.S. Air Force, plus all police departments and every sheriff's office in the state. Providing the vital computerized services to all these agencies are 60 Model 43 buffered send/receive selective calling teleprinters and 28 Model 4430 buffered multipoint display terminals manufactured by Teletype Corp.

"One result of all of this is if something happens anywhere in the state, our entire network knows about it immediately via transmission through Teletype equipment," Gallagher said.

Looking back on the changes in communications, Gallagher pinpointed two technological changes that have become critical to public safety. "First was the widespread use of two-way radio, and the second factor has been the introduction of the computer. With the computer, we tie into the National Crime Information Center, motor vehicle, registration offices, warrant bank and so on utilizing Teletype equipment," he said.

Within seconds, operators can check drivers licenses, plates and names.

"When an officer calls in regarding a suspicious auto parked near a bank, we can check on it in less than 10 seconds. If the car belongs to a felon with a history of bank robbery and violence, the officer can be forewarned before any approach is made," Gallagher said.

But with the computer came a new set of problems. Gallagher recalled, "Our terminals were not able to keep up with the computer or with the enhanced quality of the phone lines for more rapid transmission. We were falling behind, and I didn't want to slip two or three generations."

"We upgraded to the Teletype Model 33 teleprinters which were a better, faster terminal. We also added some Model 35s and 37s. Later, the Model 40 CRT terminal and Model 43 teleprinters were introduced," he said.

Once the Model 43 was selected, it was installed in every sheriff's office in the state. Major centers received the 4430, including headquarters here where six were installed.

This installation of both types of terminals took three weeks due to the capability of the terminals to duplicate the older terminals' options by simply inputting them from the keyboard. Operator training was delayed until the equipment was in place and the dispatchers had an opportunity to familiarize themselves with the units.

One unforeseen development was the increased use of computer time. "We have a 29 cents charge per CPU second for the computer," Gallagher said. "Before, we could plan our budget around CPU time. But once we got on-line with [the terminals], our CPU time went up. What happened was that our law enforcers are using the terminals more and leaving the radio channels clear for emergency use. With that, instead of having to

(Continued on SR/30)

THE LOOPHOLE IN

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Demand for Convenience Spurs EFT Systems' Growth

By Robert W. Mahoney
Special to CW‡

Consumer demand for convenience and the increasing need for competitive and cost-effective operations have led to an explosive growth in electronic funds transfer (EFT) systems.

Today, supermarkets, convenience stores, drug stores, discount chains, department stores and gas stations are automating the delivery of services to consumers through the application of automatic teller machines (ATM), point-of-sale terminals and customer transaction terminals connected to EFT networks.

The retail industry has long been acquainted with consumer acceptance of self-service. Customer demand for convenience has led to 24-hour grocery and gas station outlets and an increase in cost-effective self-service operations.

Automatic banking services also evolved from consumer demand for convenience. Today, the most prevalent and consumer-accepted delivery system for these services is the ATM.

During recent years, ATM transactions have accounted for the largest percentage of electronic payments. The number of ATM cards issued to date exceeds 70 million. Projections indicate that by the end of 1983, the number of ATM cards issued will surpass those of credit cards.

High Level of Acceptance

Since the introduction of ATMs in the early 1970s, more than 25,000 units have been installed. A high level of consumer acceptance is demonstrated in increased ATM usage statistics. Figures from 1982 show that the average monthly transaction volume per machine rose to more than 6,000 from 1,800 in 1970, according to *The Magazine of Bank Administration*.

Diebold, Inc., the nation's leading supplier of ATMs with the largest number of units installed (more than 12,000 of the 25,000 units), has placed many of these units in shopping malls, drug stores, supermarkets, convenience stores and gas stations around the country. The success of these high-transaction volume installations has led Diebold to the introduction of systems for automating the delivery of consumer services to a broad range of markets.

The application of this technology is seen in other industries such as travel and transportation, for displaying travel packages, schedules and dispensing tickets; in government, for greater control over the dispensing of food stamps; and in the fuel distribution industry, for automating the dispensing of gasoline products.

For many retailers, the installation of ATMs has increased customer traf-

(Continued on SR/30)

The Diebold Tabs 903 consumer transaction terminal.

MURPHY'S LAW.

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MOTOROLA INC.
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Demand for Convenience Spurs ATM Growth

(Continued from SR/29)

fic and reduced operating expenses. Personnel requirements have been reduced by automating such transactions as account inquiries, funds transfer for account payments, cash withdrawals as e means of reducing check cashing, gift certificate purchases, catalog and insurance sales and numerous other consumer services.

Diebold has also introduced e consumer transaction terminal that provides consumers with a means to access information and perform self-service transactions. This general-purpose terminal may be used to display catalog listings and merchandise in inventory.

Once a customer selects an item for purchase, the system can also be used to authorize the purchase (based on customer account information). The system can be programmed to dispense scrip identifying the item selected end eutometically debit the customer's account at the time of dispensing, thereby reducing fraud, check-cashing time and losses associated with checks.

Financial transactions, such as account inquiries, funds transfers for eccount payments and purchase eu-

'Participation in shared networks by financial institutions and retailers is increasing the base of ATM and EFT systems available to the consumer. The increase supports the previously stated projection that debit cards [ATM cards] will exceed credit cards issued by the end of this year.'

thorizations for acquiring goods, services or cash, may also be performed by the system.

Wide-scale eutomated service delivery through these systems is possible due to the existence of regional and national ATM/EFT networks. National systems, such as Plus, Cirrus and the Regional Interchange Association, as well as systems under development by Mastercard, Visa and American Express, are connecting ATMs across the country end providing consumers with even greater access to their funds for purchasing power.

Major statewide and regional systems such as Owl, the Iowa Transfer System and Mpact are already reducing the distance consumers have to go to eccess their accounts.

Data transmission for these shared systems is handled by e "computer switch," which moves electronic transaction information between participating financial institutions and retailers.

Increasing participation in shared networks by finencial institutions end retailers is increasing the base of ATM end EFT systems available to the consumer. The increase supports the previously stated projection that debit cards (ATM cards) will exceed credit cards issued by the end of this year. The increase also ensures an ever-growing card base of active ATM users for retailers considering participation.

As e cost-effective and competitive epproach, the decision to automate consumer services is vital to ongoing profitability. The retail industry is faced with the objective of controlling costs while extending customer services and increasing market share. ATMs, consumer-activeted terminals and EFT systems provide a meens of achieving that objective.

Mahoney is senior vice-president with Diebold's Electronic Products Groups in Canton, Ohio.

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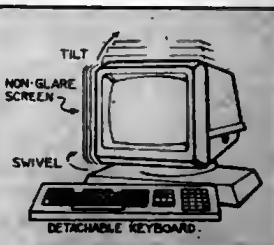

Ergonomics: MPC's terminals offer a non-glare screen, rotate 60° in either direction and compensate for height variations by tilting up to 20°. The detachable keyboard meets European DIN specifications.

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Police Boast 'Best' Rural Net On Radio System

(Continued from SR/28)

replace our radio equipment after e normal 10-year use period, we'll get several extra years service. The efficiency of the system because of the terminals is outstanding," Gallagher maintained.

"We put out all 'All Points Bulletins,' stolen cars and the like both on broadcast and via teleprinters, which gives everyone e hard copy at once. Not only is everyone current, but a permanent record is kept in the computer," he said.

"Think of it this way," Gallagher said. "A police officer will train every month on the target range. But he'll only use that weepon perhaps once or twice in his whole life. He uses his radio every day, and how much training does he have with that?

"If policemen would spend as much time learning what they could accomplish with communications as they do with weapons, we'd have a terrific force."

Trust Bureau Places Success On Remote Batch Processing

CHARLOTTE, N.C. — To many in the data processing industry, remote batch processing is passe technology, left behind in an era of distributed data processing and sexy minicomputers.

But to NMF, Inc., it is one of the foundations on which it has built its success — so successfully that the firm located here is now the second largest trust accounting service bureau in the U.S.

Not only does the remote batch concept appear to be surviving at NMF, it seems to be going somewhere fast.

In 1974, the company consisted of two employees and had one customer. Today NMF has approximately 260 customers in 39 states including Alaska, 50 employees and a projected annual growth rate of 25%, according to Dr. Phil Manning, president of NMF.

In addition to a potential U.S. market of mid-size financial institutions that Manning numbers between 1,000 and 1,500, the company also has set its sights on the banks of Europe, to be served by a future NMF subsidiary in the UK or on the continent.

The remote batch concept was not new when Manning and his partner, John Fogle, solicited Raleigh's Bank of North Carolina as their first customer. They were among the first to specialize in the complex field of processing data for financial institutions — the Auto-Trust system was the first of NMF's products — but their method of offering time-sharing on a centralized mainframe had become feasible in the late 1960s.

It appealed to companies that were unable to afford, or were simply uninterested in making, the large investment in hardware necessary to fully process their own business data. And at that time, the only other alternative was subscribing to a remote on-line system, which meant paying for constant use no matter how little the system might have been actually used during the day.

In the remote batch option, customers paid for the processing service of the centralized computer after investing in an entry terminal that stored the day's input on cassettes or diskettes. At a scheduled time, usually after office hours, the mainframe retrieved the data, processed it and returned it via printer by the next morning. It was a fairly easy operation, and the standard entry terminals were simple to operate.

More Than 'Dumb' Features

However, potential remote customers often sought something more from a terminal than the standard "dumb" I/O features. For NMF's customers, Manning opted for the Model 340 processing system made by Sycor, Inc. — which later became a division of Northern Telecom, Inc. The 340 was the industry's first intelligent remote entry terminal.

Originally offered to Wall Street securities firms in 1971 as a single-station desktop unit using cassette storage, it possessed the unique capabilities of quoting current stock prices and locally correcting and editing input.

"The 340 fit our needs," Manning said. "It did what we wanted, and the price was low. Also, other people were using it and had good things to say about it. It was for those same reasons that we went to the more advanced Model 350 when it came out. We've actually stayed with Northern Telecom as their technology developed — with the 340 and 350 and

(Continued on SR/32)

Dr. Phil Manning, NMF president, marking a remote batch customer.

The IBM Modem: high availability with rock-steady reliability.

A modem is only as good as its signal quality and its availability. The IBM Modem, thanks to an advanced IBM microprocessor, offers excellent signal quality, high availability and rock-steady reliability.

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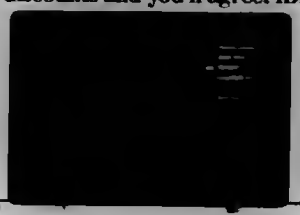

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CW-8-29

Firm Puts Trust in Remote Batch Processing

(Continued from SR/31)

now the 503."

This year NMF has contracted with Northern Telecom to purchase 115 more desktop distributed data processing (DDP) terminals for its expanding operations. About 30 will be Model 350s, which are still in wide use despite technological advances made since their 1975 appearance.

" 'One thing that tends to happen to our customers when they get our program is that they begin to grow — small ones become mediums and mediums become large.' "

The 350 represents the transition from standard cassette data storage to diskette, for twice the storage capacity of the 340 cassette's 250,000 characters and four times the 340's total 4K bytes of memory. More important, the 350's diskette base provides the user with considerable time efficiency through random access to its stored data.

NMF's remaining 85 systems will be the new DDP microprocessor Model 503. The 503 quadruples the 350's main random-access memory to 256K bytes and offers a four-diskette maximum storage of 3.2M bytes of data.

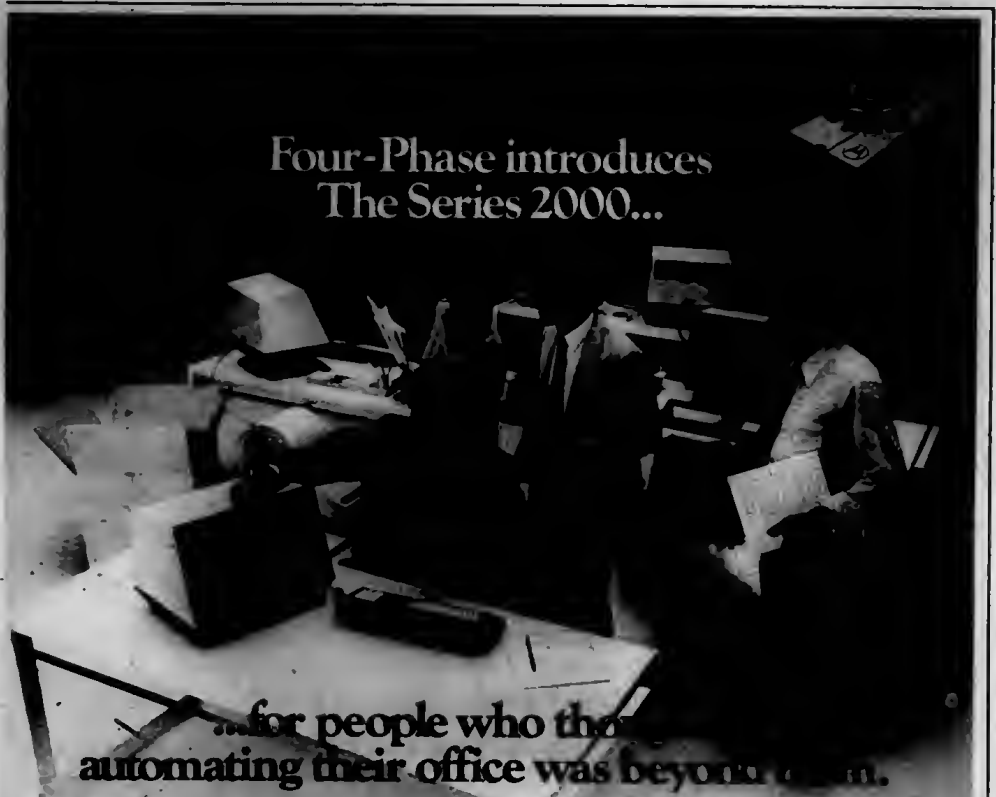
Beyond the standard I/O functions a batch processor would expect of it, NMF's 503 can perform error checking and word processing tasks, control a peripheral letter-quality printer or a 180 char./sec bidirectional serial matrix printer, conduct electronic mail and other inter-terminal communications at 9,600 bit/sec and accept Digital Research, Inc. CP/M operating system's commercial software, such as general ledger programs. "The big advantage of this is that customers can go out and buy software that we don't offer," Manning noted.

Flexibility Important

In addition to basic system intelligence, it is also important for a remote terminal to demonstrate flexibility. NMF comptroller Jerry Jefferson explained, "One thing that tends to happen to our customers when they get our program is that they begin to grow — small ones become mediums and mediums become large.

"They'll start off with maybe 250 accounts and keep growing to 500 and even 1,000 accounts. So we've been looking for Northern Telecom to come up with something to take this into consideration, and they've apparently done it with the 503. It seemed to us to have the capacity to keep expanding as much as necessary along with the customer's business."

With business up and the company, the vendor and the customers all flourishing together, NMF is busy considering new batch processing services for the future. One that is already being tested at the American National Bank in Austin, Texas, is a new trust accounting program for oil and gas well properties. "There seems to be a lot of interest in it so far," according to Harold Carter, NME's marketing director.



Congratulations!

You'll hear that a lot when you make the Series 2000 your first step into automating your office. And it's a pretty economical step, too. But that's the beauty of the new Motorola microprocessor-based Series 2000 system from Four-Phase. It's three different, integrated systems that let you start small with 8/16-bit computers like the one in our picture, then move into more powerful MC68000-based 16/32-bit machines later on. They're ideal for automating a single office, or connecting all your regional or branch offices together. And the systems are so easy to install and use, you can celebrate your first day of automation the same day your system arrives.

So what do you get for your investment? The entry level System 220 features the powerful 6809E microprocessor and gives you up to four easy-to-use workstations. The ISOS operating system inside lets you run a wide variety of business applications such as order entry, inventory inquiry, text editing and electronic worksheet. Getting started couldn't be easier.

Then there's the System 240 to which you can upgrade as your applications grow. It will give you up to eight workstations and all the memory capacity you'll need to support them.

If you need more capacity than the System 240, move straight to the sophisticated System 260. It's the bridge between today's requirements for low cost, and tomorrow's demands for high performance. The System 260 is a 16/32-bit computer based on Motorola's MC68000 microprocessor. It comes with up to eight terminals and features a powerful operating system derived from UNIX™ System III under license from AT&T. You'll enjoy working with the Series 2000, and all the productivity it will bring you. And if your friends don't believe how inexpensive it is to get started in office automation, just tell them who to call. Four-Phase, the leader in office automation technology, service and support for over a decade. And now, part of Motorola, the leader in microprocessor technology. Call 1-800-528-6050, Ext. 1599. Or write us at 10700 North De Anza Blvd., Cupertino, CA 95014. M/S 52-10A7.

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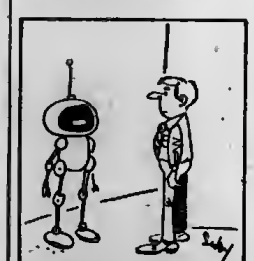

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Terminals Provide Access to 2.7 Million Parts

Data Base Keeps Aircraft Service Firm Aloft

MEMPHIS, Tenn. — Founded in May 1979, a service firm here facilitates exchange between buyers and sellers in the $3.4 billion annual aircraft parts aftermarket. Growing rapidly, the company today maintains a data base of 2.7 million parts available from over 290 suppliers.

Inventory Locator Service (ILS) provides on-line access to its parts data base to more than 230 aviation industry clients in the U.S. The firm is now expanding its services to corporate, fixed base operator and helicopter clients and to the international market.

Inventory Locator Service uses 3M Whisper Writer teleprinters.

"We saw a need for an on-line parts data base that would be as current and up-to-date as possible," ILS President Fred W. Meyer said. "We also wanted to provide complete coverage to the aircraft industry by serving not only the airlines, corporate and helicopter markets, but also those who support aftermarket sales for all of these operators.

"Our data base now gives clients the broadest possible perspective on parts availability," Meyer pointed out. "This enables them to get the fastest possible service at the lowest possible cost."

Clients may access ILS' on-line parts data base through a variety of ways, including portable, dial-up teleprinters provided to them by the company as part of its service. Terminals initially used by the company were single-function units with limited telecommunications capabilities.

The previously used terminals also were command-driven with fixed-form transaction entry procedures. Consequently, whenever ILS offered a new service capability, program commands had to be downloaded to all of the terminals, resulting in various inefficiencies.

In addition, those earlier terminals were relatively complex to operate. To access ILS' parts data base, for example, clients had to make a total of five entries.

To improve operations while eliminating these problems, ILS investigated other types of printing terminals. Based on the results of this investigation, the company is now installing 3M Corp. Whisper Writer teleprinters, according to Minnie Ash, ILS' executive vice-president.

"The Whisper Writer is a more versatile, multifunction terminal," she stated. "In addition to using it to access ours and other type computer data bases, messages can be sent and received, for example, by TWX, telex and Direct Distance Dialing. In addition, the terminals are capable of providing automatic, unattended answering.

"Terminal-to-terminal communications are also made possible by the units," she pointed out. "In the coming months, we plan to implement this capability so that clients can use the terminals to communicate directly with each other when they place parts orders or send out requests for quotations.

"The terminals will also be used to facilitate our own communications with clients in the future," she noted. "The aviation industry is heavily telex-oriented. But, once the Whisper Writers are hooked up modularly, they will provide a less expensive communications path than telex."

New service capabilities are more easily achieved with the terminals because they use a free-form rather than fixed-form transaction entry procedure, according to Ash. This makes it possible to expand service capabilities simply by providing new formats to clients, eliminating the need to download program commands.

The terminals also are easier for clients to use because they employ simpler transaction entry procedures. "The same procedure that previously involved five entries, for instance, requires only one with the Whisper Writer terminals," Meyer explained. "In addition, the terminals provide cleaner, more readable printing and quieter, more service-free operation."

Meyer added that the Whisper Writer terminals are being installed at no increase in cost to clients. "They provide a more flexible, easy-to-use, multifunction telecommunications capability," he said.

(Continued on SR/36)

NOW ELECTROHOME HAS SIMPLIFIED

Electrohome EDP 57 has achieved worldwide success in monochrome computer projection for training sessions, sales meetings, boardroom decisions and other group presentations.

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The EDP 57 monochrome system has established Electrohome as a leader in computer projection. Now Electrohome is ready for your move to color computers—and your need to project color videotapes in training sessions, sales meetings, boardroom decisions and other group presentations.

New ECP 1000 is so sophisticated, it's simple. You can't imagine how easy it is to set up and operate. Colors are automatically converged in the unit and projected through a single lens—thanks to the Electrohome breakthrough in Laser Aligned Dichroics (LAD).

Protocol Converters Extend Stores' POS Options

LOS ANGELES — A department store chain here has changed many aspects of its data processing operations through the use of protocol conversion.

Using protocol converters, the Bullock's division of Federated Department Stores has extended the capabilities of its point-of-sale terminals, facilitated its credit-checking communications, streamlined its ticket (garment tag) printing operation and taken the initial steps toward integrating new executive workstations into the DP network, according to a company spokesman.

These advances have not only resulted in more efficient operation at higher throughput, but have also yielded substantial cost reductions, a Bullock's spokesman said.

There are 33 separate Bullock's outlets located in Southern California, the San Francisco Bay Area, Arizona and Nevada. Each store has an on-site Data General Corp. Nova minicomputer, which acts as the host to all point-of-sale terminals in the store.

Furthermore, each store has an IBM 3276 peripheral controller, which connects to IBM 3278 CRT terminals and IBM 3287 printers located in the individual stores' credit and inventory control centers.

All 33 stores communicate via phone lines with the company's Los Angeles data center. In the past, as shown in Figure 1, three separate data circuits linked each store to the center.

Two of these lines enabled the local minicomputer to talk with the data center, using one line to capture all data relating to the transaction and the other to verify customer credit. The third line provided the

(Continued on SR/38)

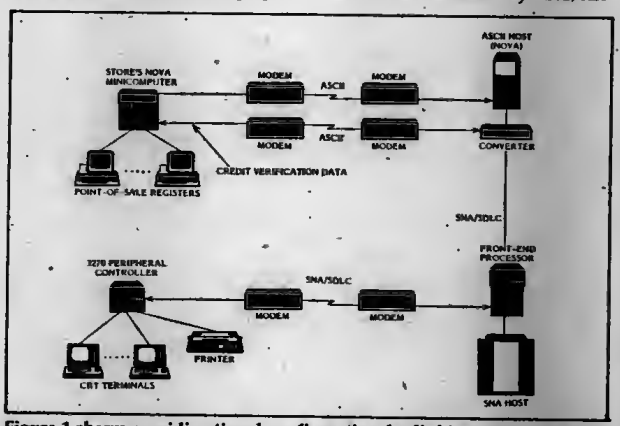

Figure 1 shows a unidirectional configuration for linking a branch store's point-of-sale registers, CRT terminals and printers to the data center.

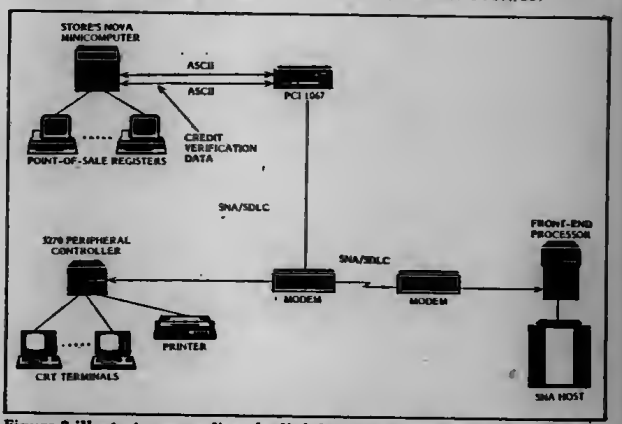

Figure 2 illustrates upgrading the link between branch stores and the data center with emphasis on protocol conversion.

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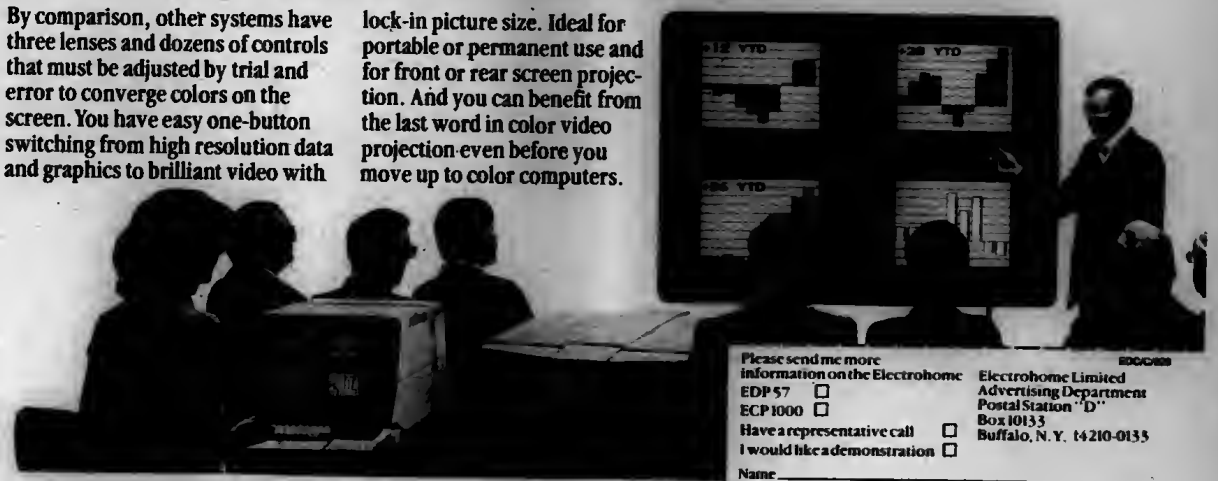

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Teleprinters Keep Aircraft Service Firm Aloft

(Continued from SR/34)

"With the deregulation and the growing availability of an increasing number of direct-dial services, the units will ultimately make it possible for clients to reduce their total communications costs," Meyer added.

Charging a monthly subscription fee to clients, ILS serves as an information clearinghouse rather than a broker. Suppliers who are not clients are charged a nominal fee for listing their parts in the ILS data base and are required to update their parts listings on a monthly basis.

Designed by Ash, ILS' parts data base and on-line programs are operated using multiple IBM System 370s on which time is rented from Federal Express Co. in Memphis, Tenn. On-line programs were first prepared in a time-sharing batch environment format. But, within a year, a change was made to an IMS format to achieve more efficient operations with less overhead.

Direct-dial telephone lines were used for on-line communications until early 1981 when Telenet was added. Now, five Telenet lines are used for 40% of domestic traffic and international transmissions, while five telephone lines are used for remaining on-line communications. All lines connect to computer systems through an IBM 3705 front-end controller.

Clients use 275 terminals to make an average of 85,000 individual parts inquiries a month, which presently is resulting in a hit rate of 57%. The ILS data base provides information on one or more sources for 57% of parts on which inquiries are made.

To make an inquiry using the terminal, a client enters the terminal identification number, password and part number. Providing a 4,000-char. memory capability, the terminal makes it possible to store parts inquiry data off-line and automatically transmit it on-line at high speeds, reducing transmission costs.

Following dial-up and entry of parts into the host, a transmit command is entered in the terminal. Within seconds, inquiry results are printed out on the terminal for each part, including names and phone numbers of suppliers, part number, description, condition, quantity available and price.

Cross-Reference Service

ILS offers an optional cross-reference service that provides rapid identification of unknown parts. The company's parts data base contains 5.6 million line items of cross-reference information relating national stock numbers to manufacturers' parts numbers. The data base also contains selected Boeing Co., Inc. and Lockheed Corp. L-1011 cross-reference files and other manufacturers' catalog data. Currently, 74 clients use this cross-reference service.

Another optional service offered by ILS is a Request for Quotation capability. Used as required, this service automatically generates letters requesting quotes to all suppliers showing the parts in the data base. In addition, ILS provides clients with inventory control services for a minimal charge.

An example of how the information can be used to avoid critical downtime was cited. "One of our clients is a national airfreight carrier based in the Midwest. The carrier had a [Boeing] 727 aircraft which was down in Los Angeles for lack of a part," he related.

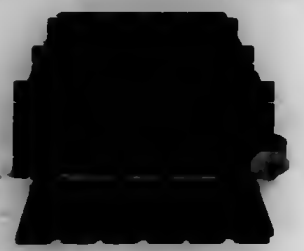
"Going on-line to our data base, the carrier found the part at a supplier located only 40 minutes from the airport. The part was bought, delivered and installed and the aircraft took off within a couple of hours, enabling our client to avoid a $20,000 loss of business," he said.

"We currently have 2.7 million parts in our data base, and this total is continuing to grow," the ILS president summed up.

"At the same time, we are looking to improve and expand our present services as well as apply them to other areas of inventory operations," Meyer said.

Five reasons why DEC users should buy Emulex communications controllers.

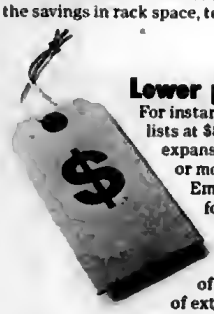
Broad product line featuring our new DMF-32 emulation.
Nobody covers LSI-11, PDP-11, and VAX-11 users' needs like Emulex. More than 15 software-transparent controllers emulating DH11, DZ11, DV11 and DMF-32. All deliver improved line-handling capabilities, in a smaller package, at lower costs.



More channels.
Emulex's new DMF-32 emulation is typical. One controller board handles up to 64 lines, vs. only eight per DEC module. And Emulex offers *all* lines with modem control, not just two. For even more lines, Emulex's Statcon Series is the answer. We simply add a low-cost port concentrator, so that with one controller board you can connect up to 256 remote *and* local terminals.

Easy growth path.
As your system grows, upgrading is simple with Emulex controllers. Just change PROM sets. Example: DH to DMF for $350. In addition, Emulex's advanced microprocessor architecture is consistent throughout the product line. Think of the inventory savings.

Fewer backplane slots.
Emulex communications controllers pack so much capability onto each board that fewer boards are needed. Take a 64-line DH11 emulation. Emulex does on one board what it takes DEC to do on 36. Think of the savings in rack space, to say nothing of price.



Lower prices.
For instance, a DEC DH11 controller lists at $8,950 per 16 lines, with expansion chassis costing $3,000 or more. Compare that to Emulex's CS11/H at $4,500 for the first 16 lines and $3,000 for each additional 16 lines. At 64 lines, you suddenly have savings of about $23,000 and a lot of extra slots to boot.

Don't speculate with your communications controller dollars. Invest in Emulex. Phone toll free: (800) 854-7112. In California: (714) 662-5600. Or write: Emulex Corporation, 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, CA 92626.

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Local-Area Network Lets University of Utah Users Put Emphasis on Flexibility

SALT LAKE CITY, Utah — At a university here, a local-area network is helping the computer science department realize an important goal: to allow students and faculty to treat the department's computing facility not as a collection of separate machines, but as one very large, highly flexible system.

"We want to give users the freedom to use computer resources on the basis of what they really need to get their jobs done, not on the basis of what facilities are convenient or feasible to use from a logistics point of view," said Randy Frank, computing facility director for the University of Utah.

An Interlan, Inc. local-area network is helping make this goal a reality by allowing a user at a terminal connected to any one of the facility's four Digital Equipment Corp. computers, to gain access to the facilities, programs and files connected to any of the other computers on the network.

The computer science department's computing facility is the largest data processing facility on the University of Utah campus.

"We support approximately 20 faculty members, 60 graduate students and about 200 undergraduates," Frank said. The facility currently has three DEC VAX-11/750 computers and a Decsystem-20. Three additional VAX-11 systems will be connected to the network in 1983. The Xerox Corp. Ethernet network provides for easy expansion should additional systems on the network be required.

Supports Advanced Research

The facility supports advanced research in a number of fields, including computer-aided design, principally in the design of very large-scale integration circuits and in solid modeling.

Other major research areas include data flow architecture, list-processing system design, data base machines and real-time digital signal processing. "My job is to provide a shared department facility to support this work," Frank said.

The University of Utah chose Interlan on the basis of its ability to deliver an off-the-shelf hardware/software system. "Our buying decisions tend to be driven by considerations of functional availability and current needs. If a product looks cost-effective and low risk, it looks very good to us," Frank said.

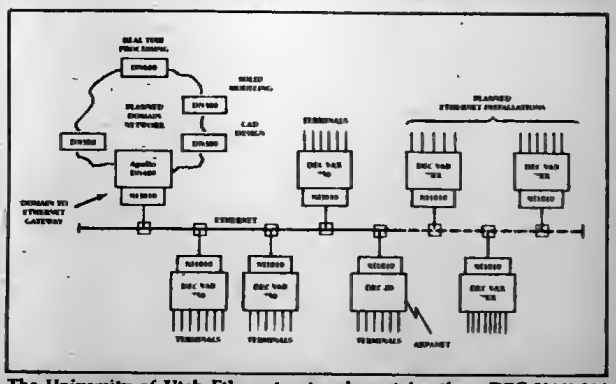
The vendor offered an integrated hardware/software system that was ready to go with little investment of effort on the part of the computing facility staff.

The vendor's DEC Unibus Ethernet communications controlier was compatible with the VAX-11 and Decsystem-20; and the vendor's Multibus Ethernet interface hardware was compatible with the Apollo Computer, Inc. DN400 that had been selected as one of the department's workstations.

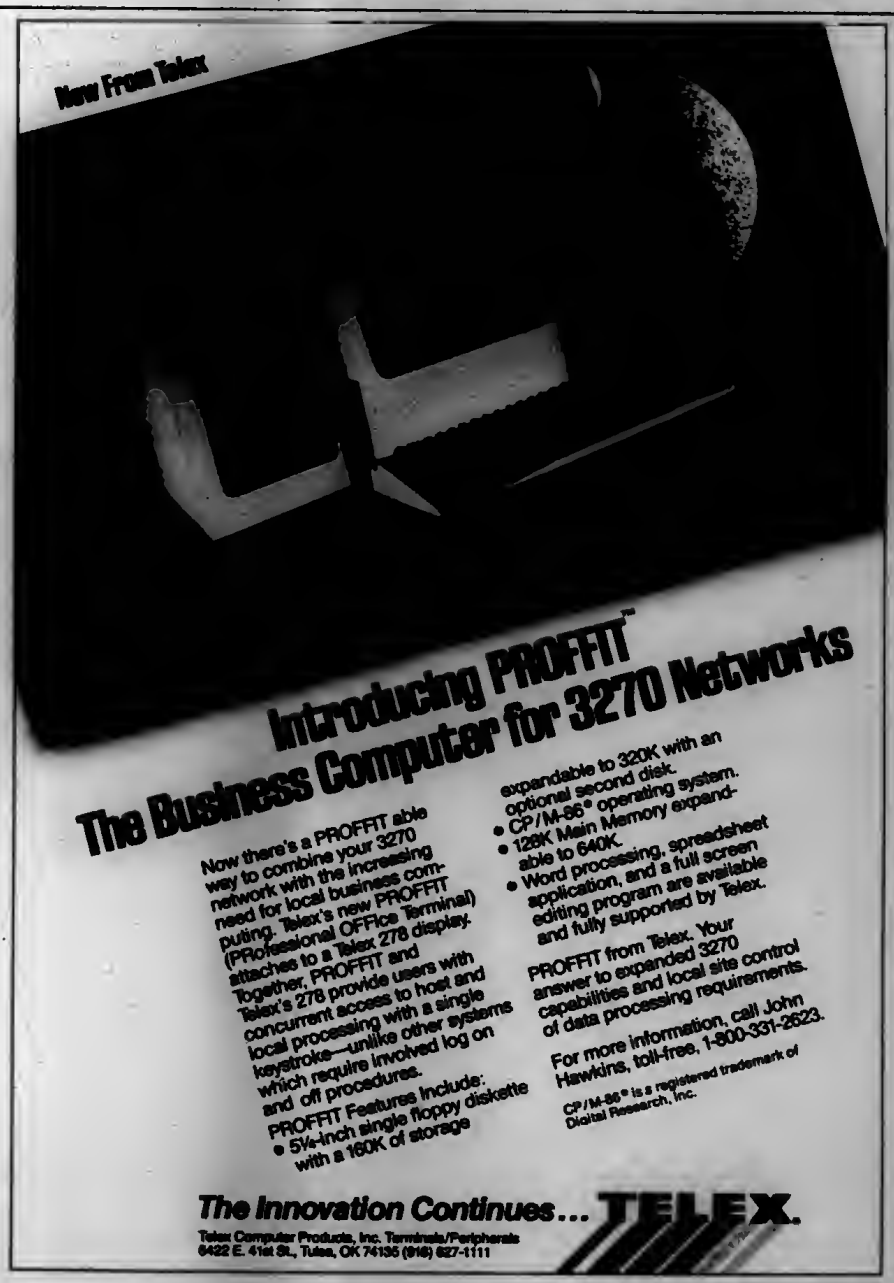
At the same time, the Unix operating system, running on three VAX-11/750s, already included software interfaces to the Interlan hardware. The only software that had to be developed was a low-level driver that would allow the Decsystem-20 to talk to the hardware.

"This is a relatively easy job,"

(Continued on SR/40)



The University of Utah Ethernet network contains three DEC VAX-11/750s, a Decsystem-20 and an Apollo Computer DN400 workstation.



Protocol Converters Boost Stores' DP Operations

(Continued from SR/35)

link between the 3276 and the data center, connecting the store's CRT terminals to the central host.

The central computer in the data center, an IBM 370-compatible Amdahl Corp. V6, was the ultimate destination for all data collected in the system. However, data came into this host in diverse ways, not all of which were efficient, the Bullock's spokesman said.

The dialogue between the 3276 and the central host was straightforward, since both the host and peripheral controller were IBM devices talking into IBM's Systems Network Architecture/Sychronous Data Link Contol (SNA/SDLC) protocol. The data between the 3276 and the SNA host went by way of the Amdahl 4705 front-end communications controller.

The dialogue between the store's minicomputer and the host was not so straightforward, since the Nova is an Ascii device whose asynchronous communications are coded in Ascii characters rather than in the highly structured, seven-level hierarchy of SNA/SDLC.

For credit inquiries, a protocol converter was used in this early configuration to transform between the Ascii and SNA/SDLC lines. Here, too, the mainframe was accessed via the 4705.

Third Pathway

The third pathway went from the Nova in the outlying store to an Ascii host (also a Nova) at the data center. However, the transactional data that reached this host had to be subsequently transferred to the SNA host through the awkward manual process of unloading tapes from the Nova in the data center and loading them into the SNA host, according to the spokesman.

This complex arrangement was finally phased out in favor of the system shown in Figure 2. A Protocol Computers, Inc. (PCI) of Woodland Hills, Calif., PCI 1067 protocol converter — suited to the line-entry mode required at the point-of-sale terminals — was located at each store, between the Nova minicomputer and the modem.

The converter transformed the Ascii data from the Nova into SNA/SDLC prior to transmission; the 3276 data, already in SNA/SDLC form, shared the same communications line back to the data center. Now the information received from the outlying Novas was compatible with the SNA host. As a result, the Nova host in the data center was no longer needed in this application and was freed to perform other functions in the data center, the Bullock's spokesman said.

The data rate for the reconfigured system, which is now installed and operational, is 4,800 to 9,600 bit/sec — in contrast to the 1,200 bit/sec maximum rate for the original system.

According to the Bullock's spokesman, one of the benefits of the higher data rate is that personnel at the point-of-sale locations can access the central host for such inquiries as locating merchandise in other branches or verifying pricing; these inquiries were not attempted with the earlier system because of the risk of backing up the phone lines at busy times.

The higher cost corresponding to the higher transmission rate is more than offset by the reduction from three lines to one. Telephone line costs for the earlier system were $396,000 per year; this figure has now been reduced by 25% or $98,000, an annual savings that will increase with rising telephone rates.

While Bullock's SNA host was, at this point, thorough-

(Continued on SR/40)

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ADM 24E

ADM 11

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Dozens of little touches add up to the convenience and comfort of High Touch. For example, we put the power "on/off" switch and contrast control knob in front where they're easy to reach.

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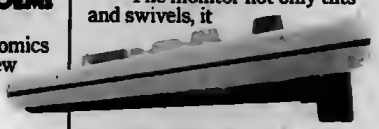

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DMV Speeds Transactions With Terminal Net

ALBANY, N.Y. — The New York State Department of Motor Vehicles (DMV) has established a statewide issuing office terminal network consisting of approximately 226 distributed processing systems.

The systems are installed at practically all DMV field offices — 103 sites — from Buffalo, N.Y., to New York City, and serve as the DMV's primary network for transactions involving the issuance of drivers licenses and vehicle registrations, according to a DMV spokesman.

The Series 21 systems, supplied by Mohawk Data Sciences Corp., are installed at cashiers' windows in each office. The equipment enables the DMV to achieve an instant audit of each office and keep track of each transaction regarding the retention of money, registration plates and stickers.

'The DMV was looking for an automated teleprocessing system with at least 95% uptime availability. A high degree of local system support was also required because of [its] heavy dependence on remote teleprocessing.'

It also has the ability to update immediately the computer files, thus removing the current time lag of data entry, a DMV spokesman said.

Foremost on the list of DMV requirements was fiscal control, followed by speed, accuracy and security. The previous method, a combination of on-line keyboard/printers and a manual validating system, failed to provide the needed level of fee accountability. According to a DMV spokesman, remittance errors occurred regularly.

Speed was also an important consideration, especially in larger offices where long waiting lines were common. A large number of DMV employees were needed at each location just to keep up with the customer flow. This left little time for other essential administrative duties, according to a spokesman for the department.

The validity of the central files, maintained in Albany, was naturally dependent on accurate input from each of the issuing offices. Any kind of mistake in transcribing motorist identification numbers, vehicle registrations or sticker numbers could have serious ramifications for law enforcement and insurance litigation.

Because New York is a title state, legal ownership of vehicles could also be affected by inaccurate recording at the local level.

Two Forms of Security

Security at issuing offices was needed in two forms: backup information files and a means of preventing unauthorized access to the system. Without backup records, if an error occurred it was very difficult to pinpoint the responsible cashier.

Even successfully completed transactions left no permanent record at issuing offices since everything was processed on-line to the central site, a DMV spokesman said.

The principal means of achieving system security was by a key lock associated with each cashier terminal and confidential passwords retained by individual cashiers.

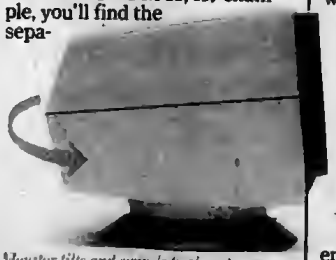
The DMV was looking for an automated teleprocessing system with at least 95% uptime availability. The new equipment would have to be compatible with its existing network of purchased IBM 3271/77s as well as the host 370/168 multiprocessor.

(Continued on SR/41)

entry almost as natural as talking.

Because the only thing that should be difficult is making an error.

On the ADM 11, for example, you'll find the separate cursor control keys logically arranged in a cross for ease of use without looking.



Monitor tilts and swivels to almost any position. Both models available with 12 or 14 inch screens.

We placed the *control* and *escape* keys close to the alphanumeric keys, where people just naturally expect to find them.

And there are no keys at all next to the space bar, so no one can accidentally hit them.

Our uncluttered keyboard, with its logical and physical separations between key groupings, improves your efficiency.

On the whole, we've taken the approach that if something isn't needed, it shouldn't be there. That's why the ADM 11 has just four function keys shiftable to eight.

And speaking of staying out of the way, our High Touch terminals' small footprint will fit as easily on a secretary's return as on an executive's credenza.

Because styling and comfort are just the first steps toward increased productivity.

No terminal has ever been so easy to live with. But don't get the idea that High Touch is the opposite of High Tech. It isn't.

The ADM 11, for example, is a High Touch conversational terminal that accepts data continuously at 19.2 kilobauds. Block mode terminals simply can't match this high throughput.

In addition there are four programmable function keys (shiftable to eight) with two levels of setup mode to reduce errors while still giving the operator maximum flexibility.

On the other hand, for a High Touch terminal that's more intelligent and has more functions and features, choose the ADM 24E. It features a moveable 24-line window you can use to look at 48 (or optionally, 96) lines of memory.

There are eight non-embedded attributes with embedded mode for existing applications, and 16 programmable non-volatile function keys (shiftable to 32) with legends on the status line (25th line). It runs in either conversational or block mode.

The ADM 24E also offers plenty of additional space for OEMs, with up to 56K ROM and 22K RAM.

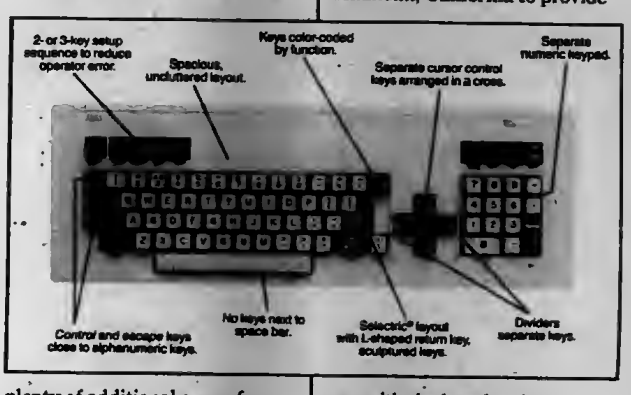
When it comes to terminal technology, we're the historic leader with the largest installed base. We've been continuously implementing state-of-the-art technology in an ever-expanding line longer than any other major manufacturer.

So it's no surprise we're introducing the most advanced stage of terminal evolution. Who else would?

Our terminals are used in more computer-based systems than any other. And survey after survey shows we're the world's favorite terminal manufacturer. When you buy Lear Siegler, you're buying proven quality and reliability, backed by the broadest network of full service centers anywhere. That means you can get walk-in Express Depot™ service, on-site service and extended warranty service in 3,000 cities nationwide.

Lear Siegler High Touch terminals are made in America—designed, engineered, manufactured and shipped from Anaheim, California to provide you with the best local support. That's one reason they're called the American Dream Machines.

Our new High Touch terminals. Because it's high time.



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Local-Area Network Gives University Users Flexibility

(Continued from SR/37)

Frank said, "requiring only two to three man-months. We were able to get the three VAXs up and running on the network within a couple of weeks."

Traditionally, the facility has taken a conventional time-sharing approach. "In general, we're moving away from strictly time-sharing and toward the use of workstations," Frank said.

"Instead of a dumb terminal connected to a processor, we are moving toward the point at which each professional user will have a dedicated workstation at his desk. Essentially, this will be a microcomputer built around a Motorola, Inc. 68010 microprocessor and a bit-mapped display capability. Workstations will be used for local editing and computing.

Ethernet was chosen as the basic networking architecture on the basis of short-term availability and long-term viability. "Without getting into the merits of broadband versus baseband technology, we went with Ethernet on the basis that, with currently available products, it offers the speed we need for high-speed file transfers and electronic mail, while available broadband networks offer only medium- and low-speed transmissions.

Converters Boost DP Functions

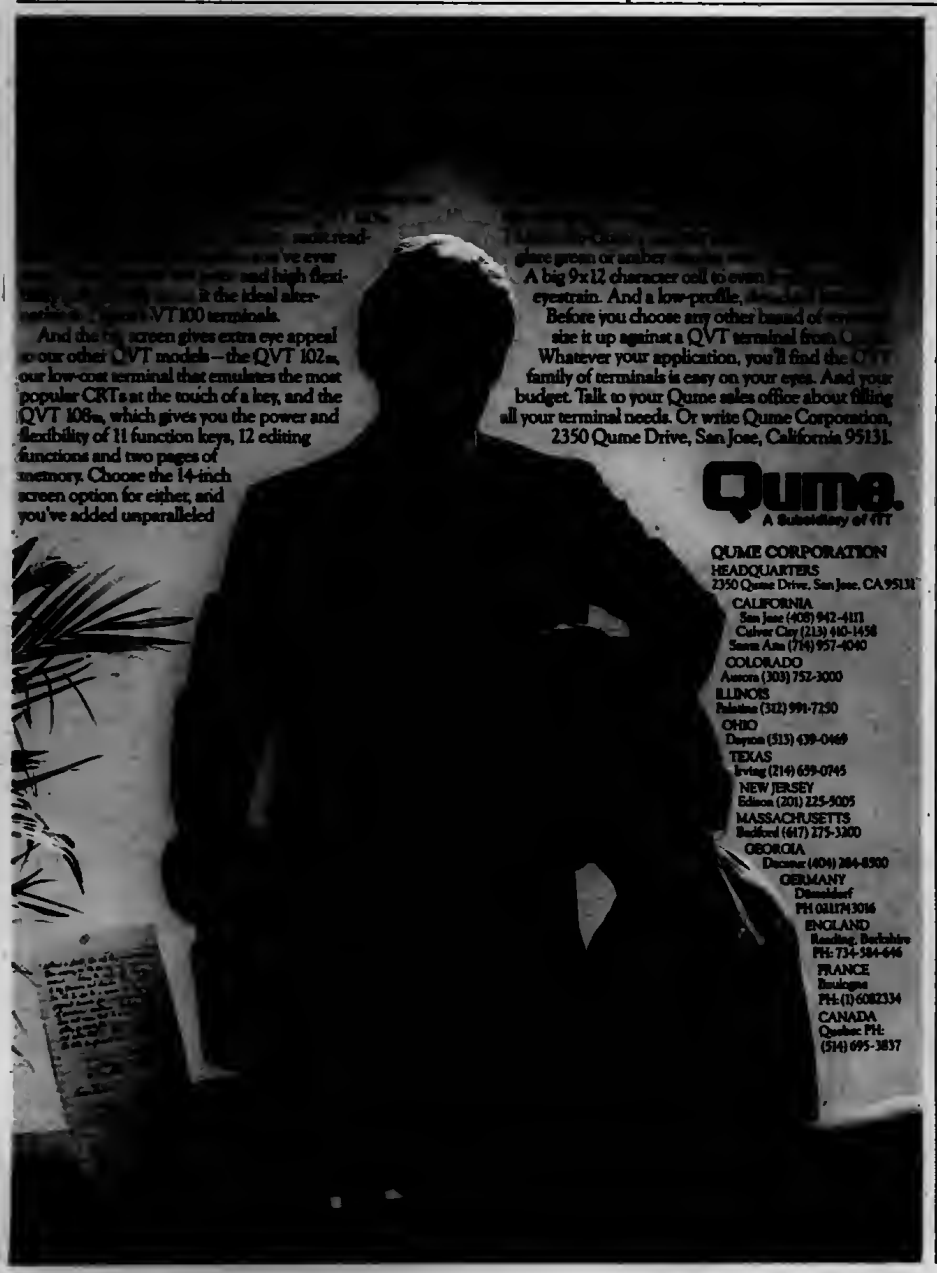
(Continued from SR/38)

ly compatible with all of the company's minicomputers and peripherals, there remained problems in compatibility with outside data sources. Specifically, the asynchronous host used by a credit bureau needed to be accessed in order to establish customer charge accounts.

The early approach to this involved accessing the credit bureau's Ascii host from a teletypewriter terminal, receiving the data at a rate of 300 bit/sec through dial up. This inefficient process was also phased out through the use of a protocol converter.

In this situation; the converter was used to convert, not between an Ascii peripheral and an SNA host, but between the Ascii credit bureau host and Bullock's SNA host. This was accomplished through the use of a standard option in the PCI 1067 that put the converter in a file-transfer mode, appropriate to accepting data from the credit bureau's Ascii host, rather than in its more usual mode of accepting line data from an Ascii terminal.

The data from the credit bureau, transformed into SNA/SDLC, is then entered directly into the SNA host, where it is accessible to the user via a 3278 terminal.



Units Give DMV License to Speed Transactions

(Continued from SR/39)

The selected terminals should be easy to use, multi-functional and compatible with local office space requirements. A high degree of local system support was also required because of the DMV's heavy dependence on remote teleprocessing.

The installation of the Series 21 systems allows the DMV to operate in a centrally controlled, distributed data processing environment. The principal mode of operation is on-line to the host computers in Albany, but the system's inherent intelligence also enables an off-line mode of operation as well.

The equipment is configured for a local office cashier. Each cashier has a typewriter-style keyboard, a CRT display unit, a hand-held optical character recognition (OCR) scanning wand and a station printer. Up to four operator stations may be connected to each Series 21 controller.

The controller itself is equipped with at least two diskette drives for local storage and a communications controller. Large office configurations also include an administrative printer for local report generation.

In practice, the DMV mails an invitation to renew licenses and registrations a month prior to their expiration date. The customer then returns the completed form, along with the assigned fee, to the nearest DMV office.

The renewal invitation has printed on it a unique transaction number in OCR-A font. This number is read into the station display, and the cashier keys the type of window or plate sticker to be issued, inserts the form to be validated in the station printer and presses the enter key. The cashier must also indicate the form of payment — cash or check — to the system.

In 15 to 30 seconds, the entire transaction is processed and recorded by the host computer. Fees are computed, the central master file and cashier file are updated, and return line messages as well as the printed document are both formatted for display and printed at the local office.

As a result, the central DMV office has an immediate record of all renewals and new licenses. They know the particular office and cashier who processed it, as well as the plate number or sticker number associated with it. The central DMV office also has a record of all cash receipts for each cashier.

The local office supervisor has ultimate control over the effectiveness of the system. Before any issuing office can begin daily processing, the office supervisor must assign cashiers and their passwords to each Series 21 controller through which the cashier might work.

'In 15 to 30 seconds, the entire transaction is processed and recorded by the host computer. Fees are computed, the central master file and cashier file are updated, and return line messages are both formatted for display and printed.'

A cashier cannot log on to the system unless the respective controller contains his initials and password. Software safeguards ensure that the supervisor is the only person qualified to initialize the system.

If the communications line or the host computer become temporarily unavailable due to storms or malfunctions, the local office supervisor can quickly switch to backup mode.

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Getting Business Computing Together.

By Emulating IBM 3271 Control Unit

Program Gives Credence to 'Batch 3270' Term

By Martin Thorpe
Special to CW‡

Batch 3270? The terms seem mutually exclusive. They usually are. A teleprocessing monitor normally requires a line to be dedicated to batch or to IBM 3270, not both.

However, 3270 networks are relatively straightforward to construct and support, both physically and technically. If batch transmissions could be made to work on 3270 remote systems, then a single line could interleave both batch and interactive messages and remove the need for separate lines and costs or awkward reconfigurations.

I conquered this problem and, in the process, allowed for full distributed IBM to Data General Corp. Eclipse CPU support.

It would not have been possible, but for the existence of a flexible and innovative IBM 3271 emulator program from DG called RCX70.

What makes RCX70 so special, is that it allows device addresses to be specified as unallocated ports, providing a mechanism for batch programs to connect to them, and allows a parallel handshaking program to review 3270 data strings before reaching the CRT or host and make any decisions about rerouting the data. Hereafter in this article, I shall refer to type "a" DG batch programs as RCXCobol and type "b" as RCXLocal.

At start-up of RCX70/RCXLocal, all CRTs are connected to RCXLocal via RCX70. This means that a message coming from a real CRT terminal first goes to RCX70, then to RCXLocal, and thereafter to wherever RCXLocal chooses, for example, to the host or perhaps back to the CRT terminal, but either way through RCX70.

RCXLocal can disconnect a particular CRT from RCXLocal, and thereafter messages from that CRT terminal will go directly to the host via RCX70. The terminal operator, however, can manually reconnect to RCXLocal at any time.

Messages incoming to RCX70 from the host will be routed to the device address embedded in the data stream, a standard protocol feature. RCXLocal is specified with unique device address ',' to RCX70 and the host monitor and is regarded as an intelligent 3270 message processor by RCX70. The host line is addressed '%.'

Assembly Language Program

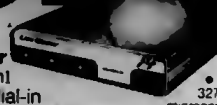
RCXLocal is a DG assembly language program whose function is to identify an attempt to start batch transmission and to allow only a single terminal to perform such by "disconnecting" all other terminals from itself. This establishes direct connect to host.

Thus a terminal operator wishing to initiate transmission first enters a unique task code for the host batch transmission task at his CRT, "Tran," entered at CRT "E." RCX70 receives the data string and passes it on to RCXLocal (assuming terminal E is connected to it).

RCXLocal notes that Tran came from E. Provided no other terminal on RCX70 is using Tran, RCXLocal memorizes E, changes the source device address to ',' and passes back the string to RCX70, addressed to '%,' the synchronous line.

(Continued on SR/44)

introducing
Dial-Up 3270



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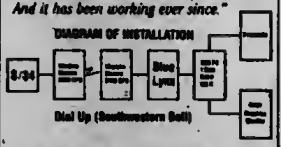

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Program Allows IBM 3270 to Batch Transmit

(Continued from SR/42)

RCX70 then sends the string to the host monitor supporting this 3271 cluster. The monitor loads the program associated with Tran and begins to execute it, just like any other interactive program. Any data strings sent out by this program down the line will be written to device address "," because the host task believes that is the origin address.

RCX70, of course, will pass such messages across the interprocess communications interface to RCXLocal. The latter can then examine the message and send it to E if appropriate for further interaction, or write significant portions to disk, ignoring E altogether. This is the crucial ability in facilitating batch transfers.

Read Into Assembler Program

All data or print files that are to be transmitted from the host are read singly, or in concatenation, into an IBM batch assembler language program. This program selects the appropriate destination queues by reference to a control statement and enqueues on the queue names to prevent multiple concurrent updates.

The input data is compressed by removing consecutive occurrences of like characters (more than four in a row) and replacing them by a control character and an iteration value. On print files, compression ratios of more than 4:1 are not unusual for preprinted form data.

The compressed data string is divided into 1,914 character-length strings, each preceded by the five digit "Next #," adding one for each block made. These blocks are written to the Bdam "TRAN QUEUE" starting at the Next #.

The Tran Queue is a wraparound queue that overwrites itself over time. To prevent untransmitted entries being overwritten, a "Boundary #" points to the last contiguously transmitted block.

Each transmission added to the Tran Queue is identified by a 3-digit transmission number, obtained from the input control statement to the program. This transmission number (unique to a transmission type such as invoices) together with time/date stamp, starting and ending Tran Queue block numbers and a zero transmission count, is built into an index record and written on the back of the index file.

Since a new transmission can invalidate one or more earlier index records through Tran Queue overwrite, the "Front" and "Back" pointers on the Control file are adjusted so that Back points to the index record just added, and Front to the first, still valid, index record, while Next # is updated to point to the next available Tran Queue block number.

It can quickly be seen that the size of Tran Queue vs. transmission activity dictates the range of index records that will be valid, and therefore the safety margin for transmission.

When the Index file fills up, Front through Back entries are shifted to the beginning of the file, and the control pointers are adjusted automatically.

Initially, any terminal invoking the batch transmission task Tran successfully through a DG CRT terminal would be sent a 16-line panel containing the oldest, as yet untransmitted, Index record (Transmission count = 0). By splitting the index into 16-line panels, the operator can browse through the index, 16 entries at a time in either direction.

Each block will be prefixed by the 3270 protocol and an erase/write issued to the address ",." No reads are the index record and to first build a control panel containing data relating to the upcoming transmission such as start and finish block numbers, transmission number and approximate duration. This panel is sent to RCXLocal, which saves the controlling data and displays the rest on the invoking CRT (E from the earlier example).

Thereafter, Tran will read each block from Tran Queue, starting at the first block number until the last block number is reached.

Each block will be prefixed by the 3270 protocol and an erase/write issued to the address ",." No reads are issued until the transmission is complete, and because of this, access method protocol overhead is limited to the Ack/Nak mechanism.

On a dedicated private circuit with top conditioning and parallel time-division multiplexed 9,600 bit/sec voice grade lines, (emulating a single 19.2K bit/sec low-end broadband line) one full screen block can reach RCXLocal every 1.3 seconds. This allows a disk-to-disk transfer rate of 5.3M bit/hour for compressed data.

Each block received by RCXLocal is checked for continuity and, at transmission end, for completeness. The blocks are written, still in compressed form, to dynamically allocated disk files on the DG disks, thus

(Continued on SR/46)

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Flexibility Was Major Consideration

Union College Opts for Mainframes Over Micros

By Scott Mace
Special to CW‡

LINCOLN, Neb. — At a time when many colleges are considering purchasing personal computers for every student, why is Union College, a liberal arts school located here, opting for a mainframe-based system instead?

According to Dean Hubberd, president of Union College, there were three considerations: cost, the question of ownership and flexibility.

Next month, when the 1,024 students return to the college, they will find Viewpoint computer terminals from Applied Digital Data Systems, Inc. in the 400 dormitory rooms and distributed around the campus.

Those terminals will be linked with one of two on-campus Hewlett-Packard Co. HP 3000 Series 44 mainframe computers.

Required Course

All students will be required to take an entry-level computer literacy course and hands-on laboratory. Faculty members will also have access to terminals for their own use and as teaching aids. Each dormitory floor will have a printer, and on-campus computer rooms will be available for nonresident students, Hubberd said.

'Liberal arts students [should] be given the same opportunity as the engineering students who are so often the primary users of college computers.'

Hubberd explained that flexibility was the major consideration in the college's decision not to buy personal computers. "The final decision was based on flexibility," he said. "Terminals not only provide computer power, but also the ability to communicate with all terminals on campus as well as data bases constructed by the faculty. That capability was not readily or inexpensively afforded with personal computers."

Since Union College is buying the terminals itself, the question of who owns the equipment will never come up, Hubberd explained.

He criticized plans at other colleges whereby students gradually purchase their personal computers during the course of their studies. Hubberd said some of the questions that might arise are: "Who owns that machine while it's being paid for? What if it's stolen or damaged? Who's responsible? What if the student drops out of college"?

Whatever the strength of his arguments against purchasing personal computers, Hubberd insists that liberal arts students be given the same opportunity as the engineering students who are so often the primary users of college computers.

Upgrade Capacity

Union College has left itself a way to tap into personal computer power at a later time, however. The Viewpoint terminals have the capacity to be upgraded to personal computers.

This fall, the college's computerized library will be attached to the central computer, and students will be able to access the on-line card catalog from their dormitory-room terminals.

The system will provide data on titles, authors and subject matter on the terminal screen and will also indicate if the books in question are on loan and, if so, when they will be available.

Once students have prepared reports using the system's word processing abilities, their professors will be able to call up these reports on their own terminals, review and grade them and then transmit the grade and comments back to the students.

Mace is a senior editor at Infoworld, *the newsweekly for microcomputer users based in Palo Alto, Calif.*

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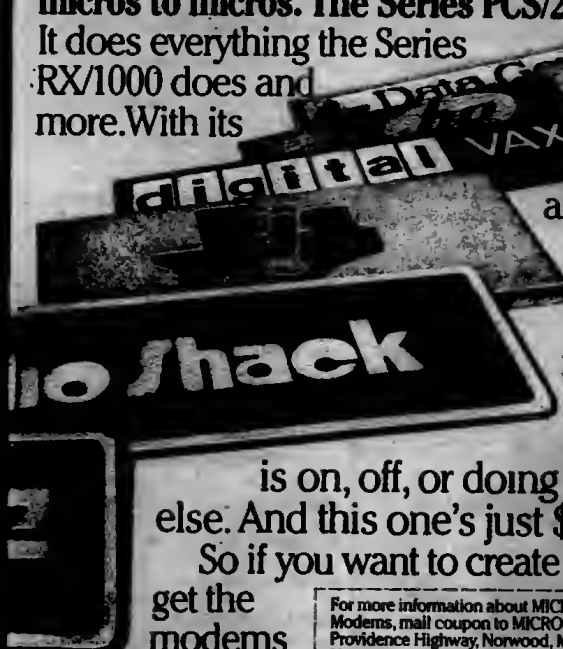

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OCR Aids Pros in Accurate Form Preparation

MOUNTAIN VIEW, Calif. — When it comes to data processing, Larry Faber had a better idea. Faber helped develop a computer system that allows health professionals to perform accounting, billing, insurance form preparation and other business functions accurately and economically — without ever touching a terminal keyboard.

Faber, who is president of Input Optics, Inc. located here, originally became involved with computers when his father decided to automate complicated dental insurance forms.

Unlike physicians who often refer their patients to specialists, general dentists perform all dental procedures in-house and must fill out insurance forms in minute detail before they can collect from an insurance carrier or patient.

Tedious Process

Moreover, if the insurance company receives a form with an error, such as a wrong tooth code or missing Social Security number, the form is returned to the dentist for correction. This tedious process delays payment, causing the dentist to have to wait for money due.

"The process of submitting insurance forms to third-party carriers results in the dentist always being about 90 days out on what's owed him," Faber explained. "When we started this business in 1972, our goal was to design a perfect form that would never be rejected by an insurance company.

"The new computer system we developed has allowed us to create the closest thing possible to such a form. The dentist no longer has to worry about a clerk making errors while keying in information because we've replaced the keyboard."

Faber pointed out that although dentists and other health professionals can purchase machines capable of processing millions of instructions per second, the person hired to sit at the keyboard and enter patient data can type in only about 40 char./min, while making random mistakes. It creates a huge mismatch of speed and ability.

"There was a need for a better and

(Continued on SR/47)

'Batch 3270' Term Becomes Reality With Program

(Continued from SR/44)

avoiding performance degradation due to reflation.

When complete, RCXLocal internally invokes a batch job "RCXPand" to take the disk file, reflate it and rewrite it to either the print queue or a fixed-length data file as appropriate. RCXP runs at a lower priority and minimally affects the RCX70/RCXLocal transmission performance.

General Polls

While transmission is in progress, it is important to allow general polls to satisfy regular inquiry requests. If the batch transmission is selecting the RCXLocal address for the writes too frequently, pausing for one second every 15 seconds or placing Tran at a lower monitor priority will alleviate congestion.

When the queue structure is replicated and multiple DG computers are allowed to access the same Tran via different task identifications, concurrent threads can be uniquely structured through Tran for each satellite. Transaction data prepared by the remote sites is transmitted to the host by a slightly different mechanism. RCX70 allows for definition of a non-terminal device address, equivalent to a 3271 port with no 3270 connected to it.

A DG batch Cobol program, RCXCobol can call RCX70 and attach itself as a 3270 to the dormant port. By expressing octal values as literals, 3270 protocol data strings can be sent directly to the host, just as if a terminal operator sent them.

Host on-line receiving programs/tasks can be invoked by a remote batch program.

Hand-Shaking Logic

Obviously, it is necessary to write hand-shaking logic in the Cobol program to handle error conditions and so forth, but basically the Cobol program reads a record on the DG and sends it as a response to the next poll, just like any terminal. The host program's outstanding read is satisfied; it writes the data to disk and issues another read.

A unique data string identifies the last record and number of records to the host, which checks for missing records or gaps.

If all is well, an OK message is returned to the RCXCobol program.

Thorpe is the director of international data processing at Max Factor & Co. of North Hollywood, Calif.

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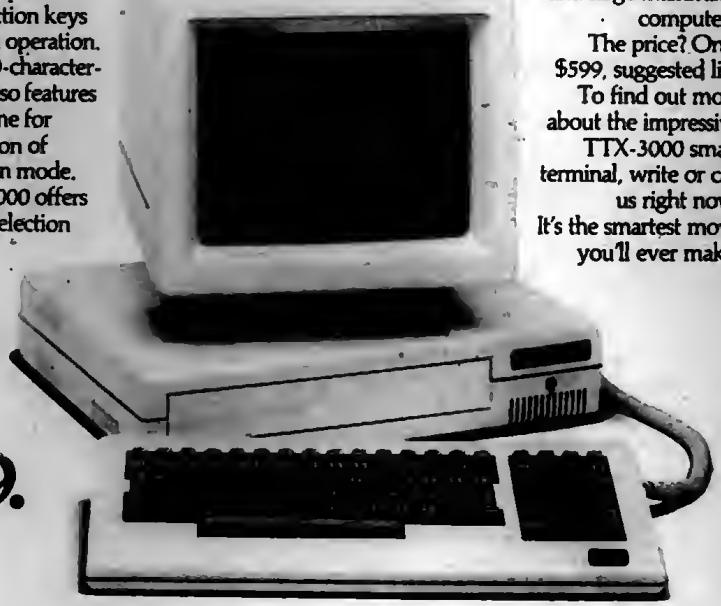

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OCR Eliminates Errors in Forms for Health Pros

(Continued from SR/46)
faster way to input more information into the computer without hanging additional terminals on it," Faber said.

"As a result, our objective was to design a complete system that could solve the dentist's specific business problems while providing the person operating the computer with a better data entry device."

OCR Equipment

Faber achieved this goal by replacing the keyboard with optical character recognition (OCR) equipment. Combined with software developed by Input Optics specifically to fit the health professional's particular business applications, the OCR equipment provides the right tool for the right job, Faber said.

The system consists of a Series 800 OCReader system with hand-held scanner wand from Caere Corp., Los Gatos, Calif., connected to a Datamedia Color Scan 10 monitor. The monitor is hooked to a Digital Equipment Corp. PDP-11/44 computer.

Faber said his company will offer the system to dentists in three different formats: one, via telephone lines where an individual office will install the Caere equipment and terminal in-house, then interface with a DEC computer located at Input Optics; two, as a complete in-house system for larger offices that purchase the computer outright; and three, on a shared basis where a group of offices will buy the system and access it through separate terminals installed at each practice.

The OCR system can read the full alphanumeric character set and allows users to program data in 28 different formats. To use the system, the clerk simply passes the hand-held wand over printed information, such as a patient's account number or the code for a specific dental procedure.

The patented Multitasking Optically Driven Input (Modi) operating system developed by Input Optics simultaneously deciphers the code and, by accessing the appropriate software program, performs a transaction on a specific patient's account. Transactions would include computing the cost of filling a cavity or performing a root canal.

This process eliminates the need for a menu system by combining a two-part manual function into a single optic step. In addition, the user can switch programs to carry out another transaction by passing the wand over the code for the new program.

Modi also prevents the operator from entering incorrect information. For example, when computing the cost of constructing a three-unit bridge for a missing tooth — a common dental procedure — the operator must enter the number of the first tooth in that bridge.

If the number coincides with a tooth that the program recognizes as impossible to anchor the bridge to, the computer will reject the data. When a correct number is entered, Modi accepts it and automatically completes the transaction.

"This system totally eliminates random errors an operator makes when using a keyboard to enter data processing information," Faber said.

"This is extremely important to a dentist or any businessman because if the data being entered is incorrect, the output, such as a patient's bill, will also be wrong. If the clerk keying in data has a tendency to transpose figures, types poorly or doesn't read well, accounting procedures at a dentist's office can become fouled up and end up costing a lot of money to

(Continued on SR/48)

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OCR Helps Pros Complete Error-Proof Insurance Forms

(Continued from SR/47)

get back in order.

"Therefore, we took appropriate steps during development of the Modi system to ensure that the data being entered is 100% correct."

According to Faber, the keyboard should be used primarily as a word processing tool for random alphanumeric functions such as text editing or writing letters — not for data processing.

"Although the keyboard is the fastest way to perform word processing, we believe it's a horrible data processing tool," Faber said. "Data processing implies the entry of repetitive numbers, letters and codes.

"For an operator to sit at the terminal and enter the same codes over and over each time a patient walks through the door is insane. With the OCR, the operator can do more work than previously possible without making any mistakes."

Speeds Collections

Faber pointed out that the syatem is not only error-proof, but it helps speed collections and also permits users who do not read well to work effectively.

"All the operator must do is wand in information the dentist checks off, then let the software do the rest," he said.

"Combined with the full color monitor, this system offers the health professional an attractive tool that is also easy to learn to use," he explained.

Though the first dental practice to use the system went on-line only last April, Faber foresees generating hundreds of applications for various professions in the near future, including local governments and the auto industry.

' "I believe a huge need exists in business to make the computer what people thought it was going to be in the first place — fast and economical," he claimed. '

"The auto parts industry offers a classic example of how Modi can be customized to solve a specific business problem," Faber said. "When a car owner goes into a service shop to order a part, the clerk must look up the multidigit part number, write it down and then send it to a secretary down the hall, who types the number onto a form.

"After waiting two weeks, the wrong part may come in because this inefficient process presents so many chances for someone to make a mistake. By making our computer system fit a particular application, we've developed a better way to do business."

In general, Faber also hopes his company's system will fundamentally change the way people use computers.

"I believe a huge need exists in business to make the computer what people thought it was going to be in the first place — fast and economical," he claimed.

"By combining innovative software with reliable hardware, we can meet this need. As far as I'm concerned, the input device is the best tool available to change the way data processing is done.

"It essentially eliminates human error. And for people such as dentists who are more concerned with practicing their profession than running a business, it'a the solution they've been looking for," he concluded.

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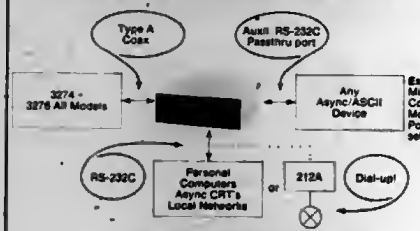

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IBM-Compatible Net Controllers Out

MILPITAS, Calif. — A family of IBM 3270-compatible controller/terminal systems said to support up to 120 peripheral devices from one controller has been introduced by The Braegen Corp. here.

Each of the two 8500 controllers is said to support two networks and up to 60 devices or a total of 120 devices — almost "four times more than the industry standard of 32 devices," a spokesman said.

The Braegen 8500 series combines IBM 3270 RG62A-type coaxial cable with local networking capabilities, the spokesman said. The series includes two controllers and two terminals that can communicate on Braegen's local-area network using carrier-sense multiple access with collision detection.

The 8500 controller is for larger capacity networks that require only computing capability from the host mainframe. The 8510 can support an additional independent remote network with other 8500 series products.

The 8500 uses a multiprocessor architecture said to share 1M byte of memory among three CPUs. The controller can be attached to IBM standard and IBM Systems Network Architecture (SNA) interfaces and provide SNA support, the spokesman said.

The Braegen 8500 family of controllers, terminals and peripherals

The 8510 PC Remote Controller also provides shared personal computing and mass hard disk storage to remote terminals that it supports. The systems can operate

(Continued on Page 50)

Forecasting the 'Third-Generation' PBX Scene

By Jim Bartimo
CW Staff

With advanced voice and data switching, private branch exchange (PBX) systems are entering into their second generation. Industry experts contacted by *Computerworld* recently evaluated this change and forecast what third-generation PBXs may look like.

PBXs from Intecom Corp., Lexar Corp. and others are considered second generation mainly because of their nonblocking characteristics. This allows "one-port access to every other port," according to Edward Horrell, president of the Memphis consulting group Mitchell & Horrell, Inc. "Now that data is on the line as well as voice, nonblocking is important because data can't suffer the delays that voice can," he said.

The PBXs from Rolm Corp., Northern Telecom, Inc. and AT&T Information Systems, Inc., formerly American Bell, Inc., provide only "virtual nonblocking," which is somewhere between first- and second-generation PBXs, Horrell noted.

Another industry expert — Dixon Doll, president of The DMW Group, Inc., Ann Arbor, Mich., — agreed that nonblocking is the key to the new PBXs and predicted that "every vendor planning to offer voice and data switching will commit to nonblocking."

Once nonblocking is established as a

(Continued on Page 52)

Scitec Unveils High-Speed Mux

NEWPORT, R.I. — Scitec Corp. has introduced a high-speed multiplexer to combine data and voice requirements over a single T1 telephone link.

The time division multiplexer, called the T-Mux BSPT1 Bit Synchronous Processor, subdivides synchronous trunks into usable lower channel speeds without intermix restrictions, the company said. As many as 128 data or voice channels can be supported in 32 channel enclosures.

Operating at speeds up to 1.544M bit/sec or 2.048M bit/sec, the multiplexer permits voice or data expansion in four-channel increments, Scitec said. Voice digitizing is supported at 16, 32 and 64K bit/sec, using continuously variable slope delta modulator voice digitizers, according to the firm. Channels may be synchronous or asynchronous.

The Scitec T-Mux BSPT1 Bit Synchronous Processor is priced from $3,000 for a four-channel unit to $9,500 for a 28-channel unit. Delivery takes 90 to 120 days. More information is available from Scitec, P.O. Box 30, Newport, R.I. 02840.

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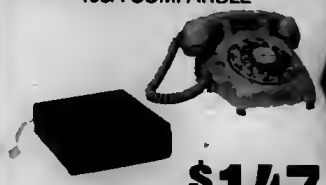

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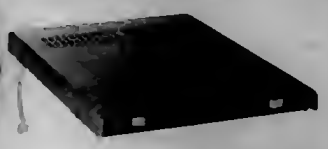

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Blast File Transfer Utility Fits IBM Personal Computer

BATON ROUGE, La. — Communications Research Group, Inc. has made its Blocked Asynchronous Transmission (Blast) communications program availabie for the IBM Personai Computer to transfer both binary and text files among a wide range of micro and minicomputers, with terminal emulation to mainframes.

Blast is available for Data General Corp. and Digital Equipment Corp. VAX-11 minicomputers, the IBM Personal Computer and other microcomputers. Blast is said to incorporate second-generation communications technoiogy in a product for computers using asynchronous modems, standard serial ports and regular dial-up phones.

The file transfer utility reportedly allows a range of computers to perform over noisy phone lines, hard-wired circuits, satellite links, packet switched networks and local-area networks.

The price of Blast ranges from $250 to $1,395 and will be available for mainframes later this year.

More information is available from the vendor at 8939 Jefferson Highway, Baton Rouge, La. 70809.

Emulates Hazeltine, DEC Units

Teleray's Dual Terminal Out

MINNEAPOLIS — Teleray, Inc., a division of Research, Inc. has introduced a dual-mode terminal said to emulate both the Hazeltine Corp. 1500 series and Digital Equipment Corp. VT100 series units.

The Teleray 100/1500, designed to operate in both DEC and Hazeltine environments, reportedly replaces Hazeltine where a change to Ansi controls is needed.

In Ansi mode, the terminal is said to emuiate the VT100 series in every respect except VT52 compatibility, including a 132-col. by 24-line display, block transmission and a bidirectional RS-232 peripherai port.

In Hazeltine mode, the 100/1500 is said to employ the same control codes and escape sequences as the 1500, 1510 and 1520 terminals and operates in both character and format modes.

The terminal is priced at $1,745 in the 12-in. style from Teleray at Box 24064, Minneapolis, Minn. 55424.

Kleen Line Bows, Protects Modems

NATICK, Mass. — Electronic Specialists, Inc. has introduced modem protection for standard four-pin telephone modular connectors and wider eight-pin connectors.

Kleen Line is intended to suppress damaging telephone and power line spikes caused by lightning, spherics or phone office switch gear. The Kleen Line security system uses semiconductor, metal-oxide varistor and gas discharge tube suppression techniques.

Model PDS-11/SUP has suppression on red and green phone lines with yellow and black lines brought straight through.

Priced at $81.95, the product is available from Electronic Specialists at 171 S. Main St., Box 389, Natick, Mass. 01760.

Controllers From Braegen IBM-Compatible

(Continued from Page 49)

10,000-ft lengths of cable without repeaters.

The 8510 is said to distribute personal computing power to as many as eight authorized terminals simultaneously with access security controlled by password and authorization matrix protection. The unit allows network elements such as disk drives and printers to be shared among the installed terminals and supports its network with common software.

The 8520 is available in two versions. The 8522 terminal is compatible with IBM 3278 Models 2 and 5; the 8523 is compatible with IBM 3278 Models 2, 3 and 4. Switchable screen sizes adapt each terminal to the desired IBM compatibility, according to the vendor.

In each 8520, key-to-screen operation, data stream order execution and switching between control units is handled within the unit, and the operator can configure the terminal before accessing the network, the spokesman said.

A typical 8500 system with eight Model 8522 displays is priced at approximately $34,300.

The Model 8523 terminal is available for $2,845.

A Model 8563 printer can be added for approximately $4,800 with a 400 line/min system printer priced at approximately $9,900 and a 1,200 line/min production printer costing about $27,900. Delivery of the system is 30 to 60 days, the vendor said.

More information is available from Braegen located at 525 Los Coches St., Milpitas, Calif. 95035.

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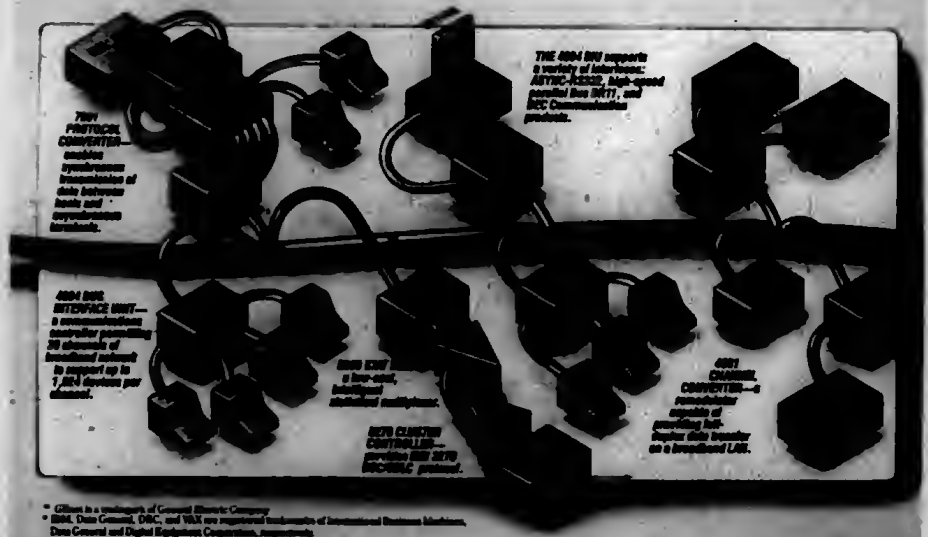

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Operators, 3270 Users Get Communications Link

CUPERTINO, Calif. — A communications link between IBM 3270 terminal users and console operators via menu-style application selection has been announced by CXI, Inc.

According to CXI, Connews communicates information regarding the status and availability of destination applications. Messages may be transmitted from one user to another and between users and console operators.

The software product operates in an IBM Advanced Communications Function (ACF)/Vtam interactive environment with no operating system or ACF/Vtam access method modification.

Features include a time, date and terminal destination display and a "hot" news area for urgent messages.

Connews is priced at $5,000. CXI is located at 111 N. Foothill Blvd., Cupertino, Calif. 95014.

Ties BSC Units to SNA/SDLC Host

Protocol Converter Introduced

WOODLAND HILLS, Calif. — A protocol converter said to allow IBM 3780 Binary Synchronous Communications (BSC) terminals and emulators to communicate with an IBM Systems Network Architecture (SNA)/Synchronous Data Link Control host has been announced by Protocol Computers, Inc.

With the PCI 3780/SNA, the veodor said, conversion is supported for printers as well as card reader and card punch devices. The user gains the ability to integrate many specialized products, such as graphics plotters, word processors and microcomputers, into existing SNA networks, according to the vendor.

When using the converter, the 3780 reportedly appears to the host as an IBM 3776-2 single logical unit workstation and includes space compression, transparency and dial-up security.

Available in September, prices for the protocol converter start at $3,100.

More information is available from Protocol Computers, Suite 100, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

NEC Offers Modules For APC

LEXINGTON, Mass. — Two combination hardware/software modules for its Advanced Personal Computer (APC) have been announced by NEC Information Systems, Inc.

Coaxxsys 86/3270 and Systems Network Architecture/Synchronous Data Link Control (SNA-SDLC)-86/3270 both operate under Digital Research, Inc.'s CP/M 86 and allow the APC direct connect replacement capability in a mainframe environment, according to NEC Information Systems, a subsidiary of NEC Corp.

The Coaxxsys circuit board and software program allows direct connection to the same coaxial cable which connects an IBM 3278 terminal to either an IBM 3274 or 3276 controller, according to the vendor.

The SNA/SDLC board and software allows for connection into an SNA environment with the APC emulating an IBM Remote Control/Unit Display Station. It can be connected via modem remote or modem eliminator to a 3705-type front end-processor or IBM host, according to the vendor.

Both options will be available in the fall with suggested retail prices of under $500 for the SNA/SDLC option and under $1,000 for the Coaxxsys.

NEC Information Systems, Inc. is located at 5 Militia Drive, Lexington, Mass. 02173.

Visual Cuts VDT Prices

TEWKSBURY, Mass. — Visual Technology, Inc. has announced price reductions on its Visual 300 and Visual 330 display terminals.

The Visual 330 is Data General Corp. DI00/200-compatible and emulates the Digital Equipment Corp. VT52, the Hazeltine Corp. 1500 and the Lear Siegler, Inc. ADM3A. The Visual 300 is reportedly Ansi X3.64-compatible, as well as DEC VT100 protocol compatible.

The price for the terminals is now $995. More information is available from the vendor at 540 Main St., Tewksbury, Mass. 01876.

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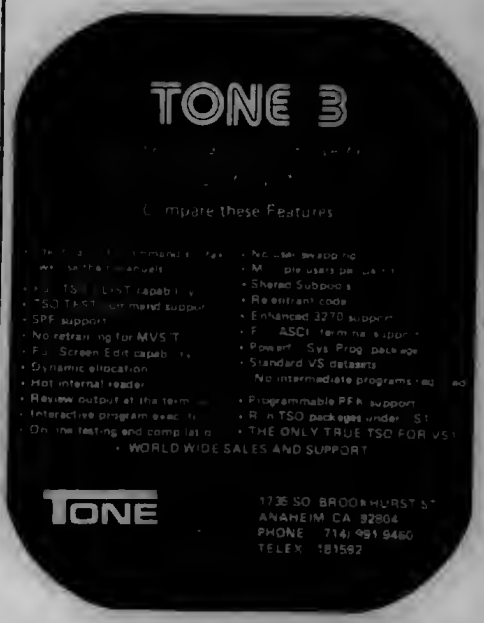

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Allows HP 2621 Emulation

PCAccess Announced for IBM Micro

AUSTIN, Texas — Tymlabs Corp. has announced the release of PC-Access, a software facility said to allow the IBM Personal Computer to emulate a Hewlett-Packard Co. HP 2621 display terminal.

The new product, supplied on a 5¼-in. diskette, is said to be an executable program running on any personal computer with 64K bytes of memory, one disk drive and any version of the IBM PC-DOS operating system.

PCAccess can reportedly be configured to operate at speeds from 110 bit/sec to 9,600 bit/sec and can be directed to use either serial port on the IBM Personal Computer. The facility is also said to support HP function keys F1 through F8 in a way similar to the HP 2621.

PCAccess is priced at $50 for a license on a single IBM Personal Computer or a right-to-copy license for $500.

More information is available from Tymlabs at 211 E. 7th St., Austin, Texas 78701.

Parallel Interface Switch Offered

PROVIDENCE, R.I. — Electro Standards Laboratory, Inc. has introduced its Model 8862-D Minicomputer/Printer Parallel Interface Transfer Switch.

The Model 8862-D, for use in minicomputer word processing applications, may be used to select between two printers — a high-speed printer for reports; a slower letter-quality printer for correspondence.

In multiple microcomputer installations, the Model 8862-D may be used to switch a single printer to support two microcomputers equipped with a parallel interface.

Priced at $175, the transfer switch is available from Electro Standards, through Box 9144, Providence, R.I. 02940.

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Modem Package Debuts for Use On Apple II Series

BOSTON — A modem and communications software package for the Apple Computer, Inc. Apple II series computers has been announced by Zoom Telephonics, Inc.

The package includes Zoom's single-slot, 300 bit/sec direct connect Networker modem and Netmaster software. According to Zoom, the modem plugs into any Apple I/O expansion slot, uses the computer's power and is approved by the Federal Communications Commission for connection to any modular phone jack.

The software, which requires 48K bytes of memory and a disk drive, is said to be a "communications freeway" enabling high-speed transmission and copying of any program or data file through telephone lines.

Zoom also announced Hotshot, a one-number instant access dialer for use with alternate long-distance telephone services. It reportedly automatically dials the computer access number and billing code.

The Networker and Netmaster are available separately, or as a package for $169. The Hotshot has a suggested retail price of $80. Further information is available from Zoom Telephonics, 207 South St., Boston, Mass. 02111.

Experts Forecast, Evaluate Change In PBX Scene

(Continued from Page 49)

standard, most future upgrades will be offered as enhancements to the current offerings. "Most people want to be able to change and keep the system they have now," Doll said.

Another trend to overtake the PBX is the addition of a CPU separate from the one that switches voice and data. In the case of AT&T's System 85, this CPU is called the Applications Processor and will be used for voice store and electronic mail.

"You're going to see the System 85 type of processor run rampant," Horrell predicted. "And as the application processor gets more popular and memory gets cheaper, the processor will handle more futuristic applications."

Among these futuristic applicatinns are voice recognition, voice-to-printer interfaces and video switching. "In addition to having voice store and forward, you'll have video store and forward," Horrell said. This will allow users to watch a message later when they are already in a video conversion with someone else.

If, as some experts have predicted, PBXs outgrow their data switching capability and become the center of larger wide networks, the next generation of PBXs could be the private network exchange, Doll pointed out.

But before they become the center of larger networks, "PBXs will become one of the centers of the automated office," Doll continued. "I think most local-area network functionality will be obtained through the PBX," he said.

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- Will Zachman, VP, Technology Assessment, IDC
  "Microprocessor Impact on Systems and Uses"
- Dr. Howard Frank, President, ConTel Information Systems, Inc.
  "Local Networks: Before You Get One"
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Blue Lynx Version Links IBM Micros to Mainframes

NEW YORK — A version of its IBM 3276 Systems Network Architecture/Synchronous Data Link Control micro-mainframe communications link has been announced by Techland Systems, Inc.

Version 1.07 of its communications link, better known as Blue Lynx, reportedly uploads and downloads data from the IBM Personal Computer and Personal Computer XT to IBM 4341s, 3033s and 3081s.

Among the features are a configuration routine said to simplify installation and a revised instruction manual. The company said the Blue Lynx-equipped IBM Personal Computers can be used wherever IBM 3276 terminals formerly were used.

The hardware and software package is available for $690 from Techland Systems, 25 Waterside Plaza, New York, N.Y. 10010.

Touch Input System Available

CHAMPAIGN, Ill. — Carroll Touch Technology Corp., a subsidiary of AMP, Inc., has introduced a touch input system available for the Datamedia Corp. Excel 22 and Colorscan 10 terminals.

The touch system is reportedly an infrared beam system with infrared LED and phototransistor detectors mounted around the video screen, creating a lattice of infrared light beams in front of the display surface. When the screen is touched, light beams are obstructed and the X/Y coordinates of the touch are transmitted to the computer.

The touch system for Excel and Colorscan lists for $1,350 from Carroll Touch Technology, 2902 Farber Drive, Champaign, Ill. 61821.

RTS Offers POS Terminals

HUDSON, Mass. — A point-of-sale (POS) terminal for automotive service stations and convenience and specialty store chains has been introduced by Retail Terminal Systems, Inc. (RTS).

The RTS-100 terminal includes the basic capabilities of on-line credit authorization, cash control, data entry/draft capture, sales audit/register balance and unattended polling of data, according to a spokesman for the firm.

The terminal also interfaces with a variety of devices to provide inventory control, transaction processing and reporting, RTS said.

Standard features include: a user-programmable keyboard (up to 66 keys); 32-char. alphanumeric instruction display; 16-char. alphanumeric data entry display; five-digit customer display; a user-replaceable alphanumeric receipt journal printer; 40-col. alphanumeric form insert printer; magnetic card reader; autodial/autoanswer or leased line modem; self-diagnostics; battery-protected memory; and three RS-232/422 communications ports.

Prices for the RTS-100 range from $2,895 to $3,695, depending on configurations and quantities, according to the vendor spokesman. Initial production deliveries reportedly are scheduled for the fourth quarter of this year.

Additional information on the RTS-100 terminal can be obtained from RTS, which is located at Kane Industrial Drive, Hudson, Mass. 01749.

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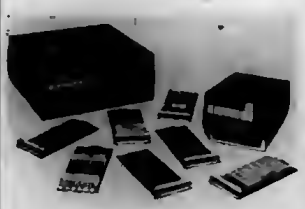


Model 706 System Scanner

CLEVELAND — A 100-channel system scanner offering matrix-switching capabilities up to 1,000 cross points has been introduced by Keithley Instruments, Inc.

The Model 706 System Scanner features matrix memory and scan, hardware triggers, 100 channel/sec switching rate, expandability to 500 channels, IEEE-488 standard and programmable interviews, according to a company spokesman.

The Model 706 is priced at $1,995, and card prices start at $250. More information is available from Keithley Instruments, 28775 Aurora Road, Cleveland, Ohio 44139.

Datapoint Unwraps Repackaged Versions Of Its 8600 Processor

SAN ANTONIO, Texas — Datapoint Corp. has released two repackaged versions of its 8600 processor that have twice the internal memory and are capable of supporting more users than their predecessors.

Along with the processor unveilings, the company also introduced two disk subsystems and an upgraded version of its Resource Management System (RMS) operating system.

Labeled the 8640 and 8645, the two processors store up to 512K bytes of error-correcting memory, compared with the previous systems' 256K bytes. The company said the added memory is what makes it possible to support more users for less money per user than previous systems. For example, support for three users costs $4,580 per user. However, when the system is supporting 13 users, the cost per user is reduced to $2,632.

The basic configuration of the 8640 consists of the enhanced processor, the new 10 Plus 40 disk subsystem that has a 40M-byte fixed disk and a 10M-byte removable cartridge disk. Extensions enable the disk subsystem to store up to 130M bytes.

The 8645 also sports the upgraded processor, but has the 10 Plus 10 disk subsystem that consists of two 10M-byte removable disks. Extensions permit users to store up to 100M bytes of information, a spokesman said.

The two systems can be used both as stand-alone units or as part of the company's Attached Resource Computer network.

(Continued on Page 56)

Datapoint Corp.'s 8640 System

Business Lines From TI Extended

AUSTIN, Texas — Texas Instruments, Inc. extended its Business System 600 and 800 lines of minicomputers with three repackaged systems that include the company's recently introduced Model 931 terminal as a standard feature.

The Business System 600A, unlike previous 600 series members, connects the unit directly to the processor, eliminating the need for a separate controller board. An optional fiber-optics capability can be added to the system via a four-channel communications interface, a spokesman said. The 600A has a throughput rate 1½ times that of its predecessors.

The Business System 800 A and B contain the four-channel interface as part of the standard package. The 800A series contains the Electronic Industries Association (EIA) interface as part of the basic system, while the 800B incorporates fiber optics into the initial system design, the spokesman said.

Two communications interfaces, with transmission rates ranging from 300 to 1,200 bit/sec, allow connection of additional terminals to the basic configuration. The CI404 interface provides four fiber-optic channels that accommodate four Model 931 fiber-optic terminals. The CI403 interface features four buffered asynchronous channels capable of supporting four 931 EIA terminals.

The 931 is equipped with a printer port that operates a printer directly from the terminal.

Prices for the 600A range from $28,300 to $50,350, depending on the configuration and data storage options chosen; the 800A ranges in price from $50,340 to $85,340; and the 800B lists for between $51,050 and $86,050, the company said. TI may be reached through P.O. Box 402430, H-668, Dallas, Texas 75240.

For Business Professionals

Notebook-Size Micro Unveiled

SANTA CLARA, Calif. — Convergent Technologies, Inc.'s year-old Advanced Information Products Group has unwrapped a notebook-size microcomputer aimed at the business professional.

Christened Workslate, the 8½ in. by 11 in. by 1 in. system contains an 8-bit processor, 80K bytes of memory, a typewriter-style keyboard and calculator pad, a display showing 16 46-char. lines and an optional printer. The 3½-lb unit requires only batteries to operate, a spokesman said.

The device allows executives and managers to build integrated electronic work sheets used for formatting information and data for a variety of business and financial reports. Work sheets have "what-if" capabilities that allow business professionals to analyze and forecast results based on information keyed into the system.

The lap-size computer can serve as a tape recorder, calculator, speaker phone, automatic dialing phone and connection to other computers and data bases; it can also serve as an electronic notebook for appointments, phone numbers and reminders, the spokesman noted.

Fall Enhancements

Software enhancements for the system, called Taskware, are expected to be available in the fall, according to the company. Some of the packages that will be available include Portfolio Analysis, Estate Planning and Personal Tax.

The system, expected to compete with Radio Shack's Model 100, is priced at $895 and will be available in quantity in January 1984 through the American Express Merchandise Sales Christmas Catalog and selected retail channels.

Convergent Technologies, Inc.'s Workslate

Further information on the system, its software and peripherals is available from Convergent Technologies, located at 2441 Mission Technology Center, Santa Clara, Calif. 95050.

Gould's Concept/32s Get Memory System

FORT LAUDERDALE, Fla. — The Computer Systems Division of Gould, Inc. has announced a multiprocessor shared memory system for use on its Concept/32 family of computers.

According to Gould, the system can support up to 16M bytes of shared memory and 32 processors through 16 ports, using such features as cache memory write-through, 53M byte/sec memory bus and eight-way interleaving within a single 2M-byte memory module.

Software support for the multiprocessor shared memory system is provided by Gould's MPX-32 operating system, which allows users to define shared memory partitions, Gould said.

Two basic systems, one to support up to eight ports and the other to support up to 16 ports, are available. Each port can handle a single CPU or be used with Gould's CPU/IPU combination to obtain the 32-processor configuration. Each system includes a cabinet, chassis, power supply, shared memory controller and master clock.

A typical system, which includes the basic eight-port capability, two port kits with 30-ft cables and one 2M-byte shared memory module, is priced at $69,000. Prices for the individual memory modules are $8,000 for the 1M-byte module and $14,000 for the 2M-byte version. Gould is located at 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33310.

Sumicom, Inc.'s System 330

Twice the Disk Storage of IBM Micro

Sumicom Announces Color Micro

TUSTIN, Calif. — Sumicom, Inc. has announced a color, 16-bit personal business computer featuring integrated software and said to offer over twice the disk storage of a comparably configured IBM Personal Computer at an 11% lower price.

The Sumicom System 330 Business Personal Computer features a range of software that allows data from one application to be integrated into another. The 330 supports Digital Research, Inc.'s CP/M-86 and Microsoft, Inc.'s MS-DOS operating systems, as well as the programming languages Fortran, Cobol, Pascal and enhanced Basic for users who want to develop their own applications programming.

The unit comes with three free on-board option slots and an expansion unit that allows six additional slots to be attached for RS-232C interfaces or general I/O and engineering interfaces. The 330's color terminal offers eight basic colors, with 64 different variations.

The system is said to use a 93-key full-function Ascii keyboard with a standard alphanumeric typewriter keyboard, a 10-key numeric pad, 14 edit keys and eight keys that provide 16 functions.

Based on the Intel Corp. 8088 microprocessor, the System 330 is available in several configurations, ranging in price from $1,795 to $3,625.

The latter version, the Model 330E, is said to be the most suitable for entry-level business processing. It provides for two 5¼-in. diskette drives, with 720K bytes on each drive for a total of 1.44M bytes.

Hard disk-based systems holding either 8M or 16M bytes and ranging in price from $5,665 to $6,475 are also available, Sumicom said from 17862 E. 17th St., Tustin, Calif. 92680.

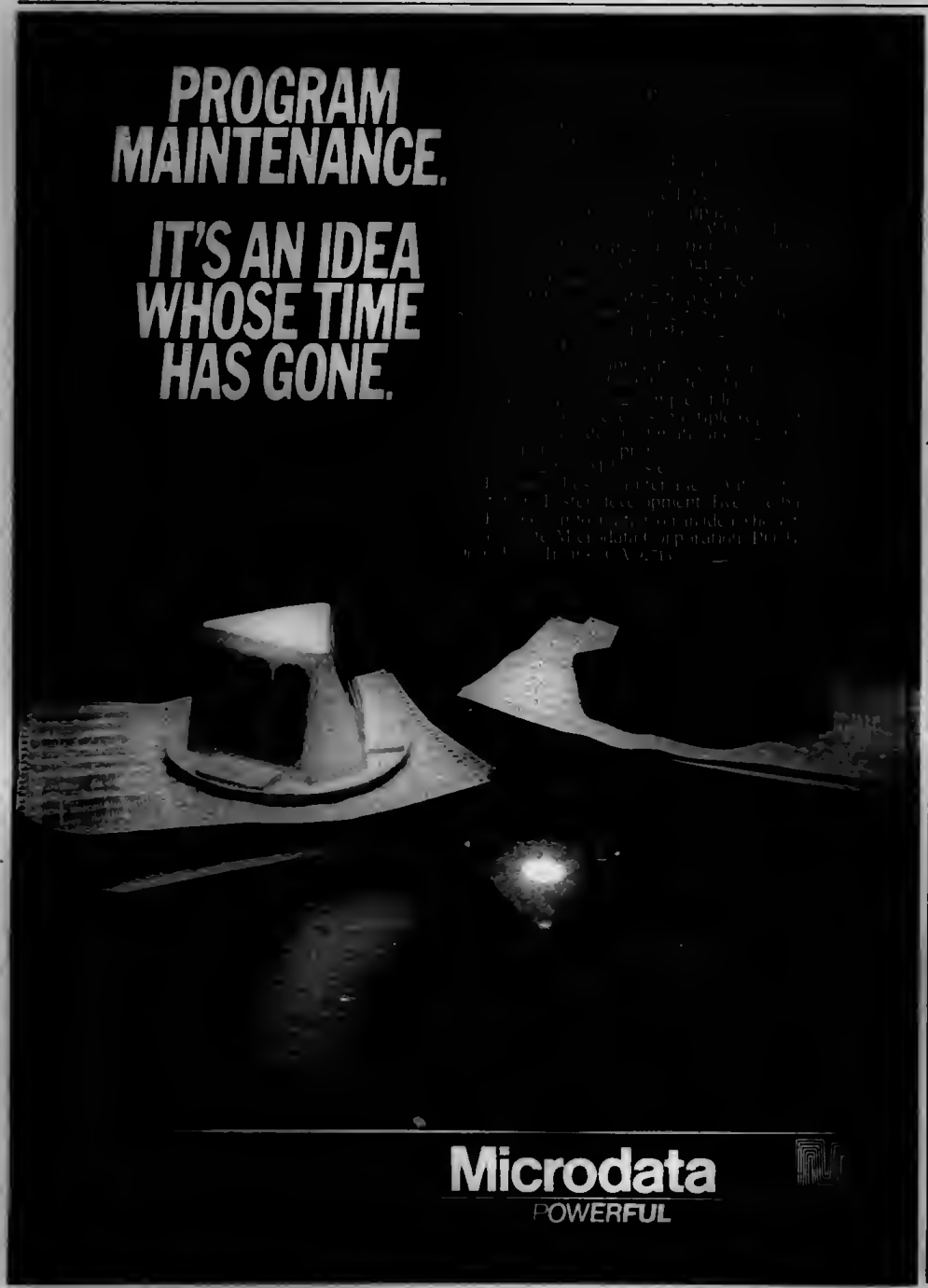
Datapoint Repackages Its 8600 CPU

(Continued from Page 55)

system.

Enhancements made to the operating system, dubbed RMS 1.11, were added to support the capabilities of the 10 Plus 40 and 10 Plus 10 disk subsystems and the firm's laser printer. In addition to this, Datapoint enhanced its Integrated Electronic Office System word processing software by adding to its format and editing functions.

The repackaged systems and disk subsystems are available immediately, Datapoint said from 9725 Datapoint Drive, San Antonio, Texas 78284.



Modcomp Introduces Four Products

FORT LAUDERDALE, Fla. — Modular Computer Systems, Inc. has introduced four high-performance products said to be completely compatible with its existing systems lines.

The products unveiled include the Classic II/15, a single-board, real-time minicomputer system; Modacs V, an intelligent process I/O system; Modacs II, a new supervisory data acquisition and control subsystem; and the 4185-X Disc Subsystem, said to be a line of low-cost disk devices.

The smallest member of the Classic II family, the Classic II/15 contains the II/15 CPU, 512K bytes of memory, I/O processor, a floating-point unit and console interface and runs under Modcomp's MAX IV operating system. Users have the option of purchasing the single board (Model 1815) or a rack-mounted Classic II/15 with a four-slot chassis and power supplies.

Modacs V was designed for use both as a stand-alone system interface or as a satellite in distributed industrial applications. The basic Modacs V assembly accommodates 16 process I/O option cards expandable to 64 and an integral CPU and optional controllers. The MAX IV operating system, used to support Modacs V CPU, is included in the purchase price.

Modacs II is a full-function process interface for Modcomp's Classic II family of real-time computer systems. The basic assembly accommodates 16 process I/O cards and may be configured for single-drop or multidrop networks.

The 4185-X Disc Subsystem reportedly offers users up to 40M bytes of on-line disk storage in a series of compact, highly configurable Winchester disk packages. Users have the option of selecting a combination of Winchester or floppy disk media.

Available for shipment in October, prices are as follows: Classic II/15, $8,500 to $12,000; Modacs V, $14,500; Modacs II, $6,200 and up; and the 4185-X Disc Subsystem, $8,300 to $12,300.

Modcomp is located at 1650 W. McNab Road, Fort Lauderdale, Fla., 33310.

DML Unveils Turnkey System

NEW YORK — An integrated family of financial management software packages that comes bundled with the IBM Personal Computer has been unveiled here by DML, Inc.

The Business Accounting Control System includes programs for order entry, accounts receivable, accounts payable, payroll, inventory control and automated general ledger. All programs are written in RM Cobol and can be used on Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems, as well as Unix.

Pricing on the turnkey system starts at $19,500, DML said from 25th Floor, 50 Broadway, New York, N.Y. 10004.

For Use With 3270 Line, 4300s

IBM Announces Four-Color 3268

RYE BROOK, N.Y. — IBM last week unveiled a four-color version of its 3268 serial printer called the Model 2C.

Designed for use with the 3270 line of display terminals and the 4300 series processors, the 3268 is a wire matrix printer that operates at a maximum of 340 char./sec, with a print speed about 2.7 times faster than IBM's current color printer, the 3287. In addition, the special features for color graphics applications required on the 3287 are standard on the 3268 Model 2C, IBM said.

The bidirectional printer will print output from intermediate systems in many industry applications.

The 3268 Model 2C will be available in October and costs $8,990, IBM said from 900 King St., Rye Brook, N.Y. 10573.

DEC Cuts Rainbow Memory Prices

MAYNARD, Mass. — Digital Equipment Corp. has reduced the price of the 192K-bit random-access memory option for its Rainbow 100 personal computer 40%, from $1,095 to $650.

The company said the price cut will make it easier for users to purchase the memory upgrade which, DEC said, is necessary to take advantage of certain types of popular software packages such as Lotus, Inc.'s Lotus 1-2-3 and Digital Research, Inc.'s Concurrent CP/M.

The expanded memory also enhances the graphics capability of the Rainbow 100, the company noted.

More information is available from DEC in Maynard, Mass. 01754.

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Facit 4528T Will Print Text, Matrix Characters, Graphics

NASHUA, N.H. — Facit, Inc. has unveiled a 165 char./sec intelligent letter-quality printer said to print normal text, matrix characters and pin graphics.

The Facit 4528T printer is a multipass unit with a decibel rate of 60 and a design said to provide a hinged cover available in a solid top with rear paper exit or slotted top for immediate tear-off directly above the tractors.

In standard text mode, the Facit 4528T reportedly produces letter-quality characters unidirectionally or bidirectionally, with selectable standard, boldface, condensed, extended and hybrid print styles. The unit is capable of printing in 10, 12 or 17 pitch or proportional spacing and can achieve the speed of 285 char./sec at 17 char./in.

Incrementing and decrementing counters are incorporated in the 4528T for sequential label printing and message variations. These functions are directed by an internal microprocessor without adding special controllers or interface cards.

Featuring continuous tractor feed and multipart form capability for original plus five copies, the Facit 4528T is available in 136-col. line length and costs $1,595. Facit is located at 235 Main Dunstable Road, Nashua, N.H. 03061.

Rainbow Receives Options

SUNNYVALE, Calif. — An internal hard disk system and memory boards for the Digital Equipment Corp. Rainbow microcomputer have been introduced by Univation, Inc.

The 11M-byte disk system is housed within the Rainbow in the second floppy disk drive space; the host bus adapter plugs into the memory option slot and comes standard with 64K bytes of additional random-access memory (RAM), Univation said. A special connector allows an additional 256K bytes of RAM for a total of 384K bytes of system memory, the firm said.

The hard disk system will support both Digital Research, Inc.'s CP/M 80/86 and Microsoft, Inc.'s MS-DOS operating systems and includes full backup and restore facilities. The disk systems, which include Ramdisk software, range in price from $2,795 to $3,690 in single quantities with volume discounts available.

Univation also now offers two memory expansion products for the Rainbow. The first board is available in configurations ranging from 64K bytes to 192K bytes and mounts in the memory option position. The second board is a piggyback version and mounts directly on top of the first board. This board comes in configurations of 128K bytes or 256K bytes. All boards include Ramdisk software, the firm said.

The memory boards cost from $395 to $1,595 in single quantities from Univation, 1037 N. Fairoaks Ave., Sunnyvale, Calif. 94089.

Yokogawa Adds Prom to Plotter To Create Graphs

SHENANDOAH, Ga. — Yokogawa Corp. of America's PL-1000 four-color plotter is now offered with a programmable read-only memory (Prom) said to provide the unit with built-in capability to generate pie, line and bar graphs without external programming.

Also added were cross-hatching and labeling/lettering capabilities. With this option, downloading of information from a computer to the graphics plotter can be done faster and without additional programming, the vendor said.

The plotter has a standard RS-232 interface and plots on paper or foils to 11-in. by 15-in. It is said to be compatible with most small computer systems. Existing units can be retrofitted at the Yokogawa factory with the Prom option at a cost of $215. Yokogawa is located at 2 Dart Road, Shenandoah, Ga. 30265.

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EMC Subsystem Boosts Memory Of Wang VS-90

NEWTON, Mass. — EMC Corp. has announced a memory enhancement for Wang Laboratories, Inc.'s superminicomputer Model VS-90.

The EMC-VS-90 memory subsystem reportedly enables Wang VS-90 users to upgrade their systems' memory capacity from the previous 4M-byte limit to 8M bytes.

The EMC-VS-90 memory subsystem is comprised of 100% compatible memory cards, performing transparently to Wang's applicable VS operating systems, according to a spokesman for EMC.

The subsystem is completely compatible with the VS-100 system, thus allowing end users to utilize the additional memory capacity should they wish to upgrade to the VS-100 from the VS-90, the vendor spokesman said.

Pricing for each 1M-byte increment of the EMC-VS-90 is $7,900. Quantity discounts are available, EMC said.

More information is available from EMC, which is located at 385 Elliot St., Newton, Mass. 02164.

ST425 Drive Offers Upgrade To 25M Bytes

SCOTTS VALLEY, Calif. — A 25M-byte, 5¼-in. Winchester disk drive has been announced by Seagate Technology, Inc.

The ST425 is designed as an upgrade to the company's 12M-byte and 19M-byte models and is fully compatible with industry-standard ST506 controllers, according to a spokesman for Seagate Technology.

Incorporating a conventional stepper motor for read/write head positioning combined with temperature compensation servo, the ST425 has a track density of 480 track/in. or 4.25M byte/surface. Average access time is 60msec, and track-to-track access time is 16.5msec, Seagate said.

The ST425 reportedly uses oxide-coated media and operates at a flux density of 9,074 bit/in. The disk drive's transfer rate is 5M bit/sec, the vendor said.

The ST425 is priced at $1,090 in OEM quantities. More information is available from Seagate Technology, which is located at 920 Disc Drive, Scotts Valley, Calif. 95066.

'OK, OK, I Believe You!'

For Use With 32-Bit Megaminis

PE Unwraps 125 In./Sec Tape Drive

OCEANPORT, N.J. — Perkin-Elmer Corp. has introduced a 125 in./sec high-performance magnetic tape drive for use with the firm's line of 32-bit Megamini computers.

Mounted in the standard PE 56-in. cabinet, the new HPTD/125 drive is said to be compatible with PE's Models 3205, 3210, 3230, 3250XP and 3200 MPS superminicomputers. The tri-density HPTD/125 has a data transfer rate of up to 780K byte/sec and data compaction of up to 180M byte/reel.

The HPTD/125 reportedly can read or write in three industry-standard formats — 800 bit/in., 1,600 bit/in. and 6,250 bit/in. Standard features include autothread/load, auto-power window, internal diagnostics/maintenance panel and formatter.

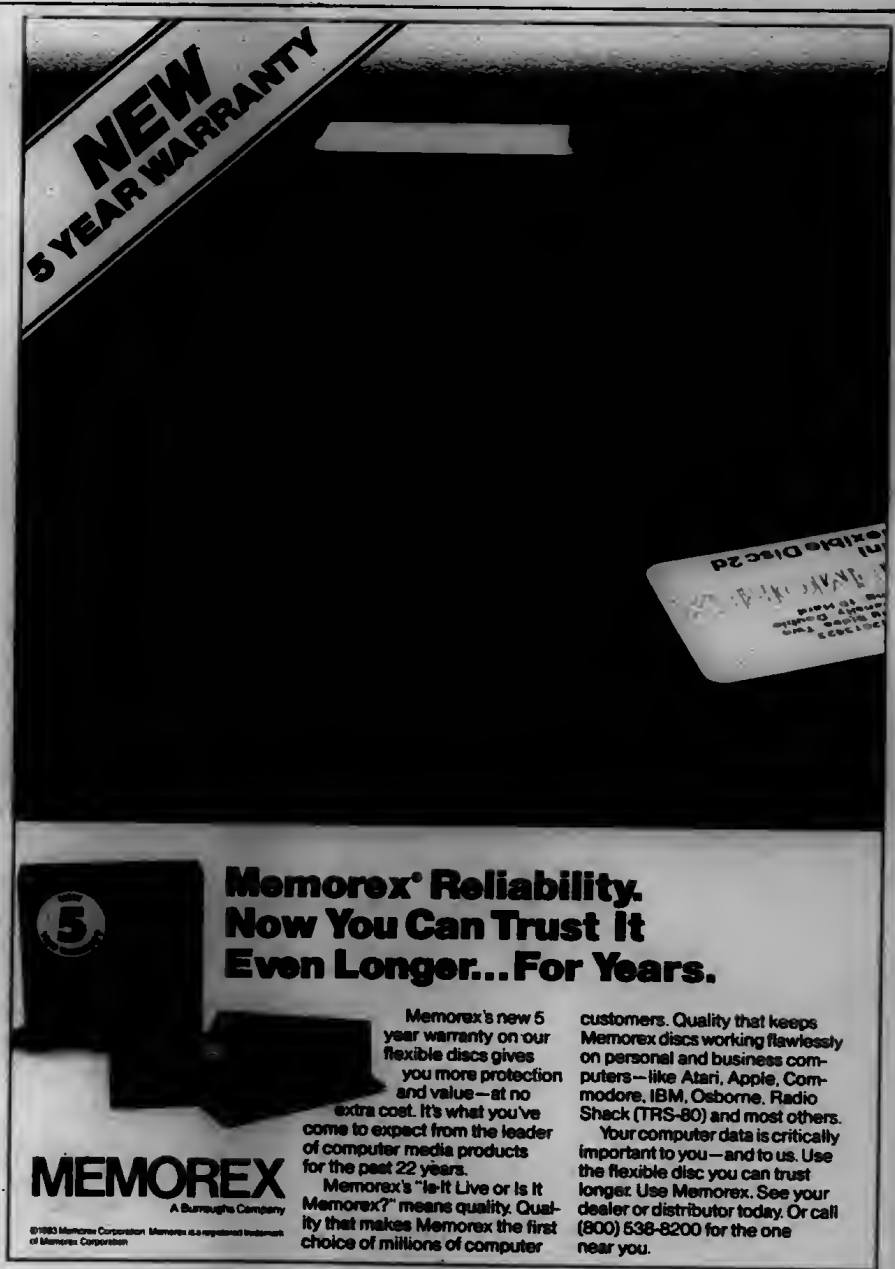
The HPTD/125 system, including tape transport, formatter, controller, cabinet, cables and documentation, is priced at $49,500, or $51,500 with gapless operation. The HPTD/125 Expansion Unit is priced at $23,000. PE is located at 2 Crescent Place, Oceanport, N.J. 07757.

Printer Claims 1:1 Graphics Ratio

LOS ANGELES, Calif. — Epson America, Inc. has unveiled a 160 char./sec dot matrix printer that reportedly provides a 1:1 graphics ratio, enabling users to create accurate graphics and true circles.

The FX-100 enables users to create their own character formats on the screen and to download the font into the printer's memory. Paper feed is accomplished via a rubber platen that can handle either single-sheet or roller-fed paper or a removable tractor to handle pin-fed paper and forms. Both are standard features.

The FX-100 is priced at $895 from Epson America, 1901 Ave. of the Stars, Los Angeles, Calif. 90067.



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Bits & Pieces

Floppy Disk Drive Released For Use With Apple Micros

ANAHEIM, Calif. — Wholesale Technology, Inc. has announced the Half Track, a 5¼-in. floppy disk drive for use with Apple Computer, Inc.'s Apple II, Apple II+ and Apple IIe microcomputers using Apple's DOS operating system Release 3.2 or 3.3.

The drive features a half-height design, cooling louvers, auto-eject diskette, a quick-release controller cable and 12msec head access speed, the vendor said.

The drive is rated at 8,000 hours mean time before failure and costs $399.95, according to Wholesale Technology, located at 1530 S. Sinclair, Anaheim, Calif. 92806.

Power Supply Product Line Protects Against Surges

TIPP CITY, Ohio — Electrolert, Inc. has introduced a new line of power supply products said to include three new surge/spike protectors that protect electrical equipment. Also unveiled were two multiple outlet extenders said to convert one electrical outlet into many outlets.

The Electrolert Master AC Control Console Model PS200 reportedly protects against spike/surge damage by filtering both the hot line and the neutral line. Also, the filter is bidirectional. The Model PS200 includes eight plug-in "u" ground outlets and retails for $119.95.

The Electrolert Power Surge Multiple Outlet Extender Model PS210 also protects against power spikes and includes four plug-in "u" ground outlets and a circuit breaker with reset. It costs $39.95.

The Model PS220 is a two-plug wall unit with surge protection. It plugs into any 120V outlet and contains a circuit breaker with reset. The device costs $34.95.

There are two models of the Electrolert Multiple Outlet Extender. The Model PS230 is a six-plug extension strip with resettable circuit breaker that costs $19.95. The Model PS240 is a four-plug extension strip that costs $17.95. Electrolert is located at 4949 S. 25A, Tipp City, Ohio 45371.

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GENERAL ELECTRIC

Compact, Dot-Matrix Printer Boasts Epson Compatibility

SANTA MONICA, Calif. — Inforunner has announced the release of its 10-in., 120 char./sec Epson America, Inc.-compatible personal printer in the U.S. market.

The dot matrix, briefcase-size Riteman personal printer features a ribbon cassette guaranteed for one million impressions. It is said to be compatible with most existing software. Features included at no cost are a tractor-feed unit with custom smoked plexiglass cover, printing that starts 1 in. from the top of the paper and upper- and lowercase characters with descenders.

The Riteman printer costs $499. Inforunner is located at 1621 Stanford St., Santa Monica, Calif. 90404.

Anadex Cuts Prices by 20% On Silent/Scribe Printers

CHATSWORTH, Calif. — Anadex, Inc. has reduced by 20% the prices of its line of Silent/Scribe printers.

Now priced at $1,300 are the firm's DP-9000A (150 char./sec) and DP-9001A (120 char./sec) general-purpose printers. The DP-9500A (150 char./sec) and DP-9501A (120 char./sec) general-purpose units now cost $1,380. The new price for the DP-9620A (200 char./sec) enhanced printer is $1,480, and the DP-9625A (200 char./sec) multimode printer costs $1,600.

Anadex is located at 9825 De Soto Ave., Chatsworth, Calif. 91311.

Davong Board Adds Memory To DEC's Rainbow Micro

SUNNYVALE, Calif. — Davong Systems, Inc. has introduced a 192K-byte memory board for Digital Equipment Corp.'s Rainbow personal computer.

Plugging directly into the Rainbow's connector, the Davong DC090-192 memory board reportedly gives the computer a total memory capacity of 256K bytes. The memory supports the Rainbow's 8-bit and 16-bit processors, Digital Research, Inc.'s CP/M and CP/M 86 operating systems and all application programs running under these operating systems.

The DC090-192 memory board is said to give Rainbow users access to a wider set of applications. Priced at $495, it is available from Davong Systems, 217 Humboldt Court, Sunnyvale, Calif. 94089.

Portable Power Supply Boasts 1,500W Continuous Power

ST. PETER, Minn. — GTO Electronics, Inc. has announced the Portable AC System Pacs-1500, a portable power supply.

The Pacs-1500 is said to be easier to use, more compact, lighter in weight and more reliable than gas generators with comparable outputs.

Features include solid-state, auto-on, consistent output, automatic system protection, polarity protection and remote control panel, the vendor said. The portable system provides 1500W of continuous power and 2000W surge from a 12V, dc battery.

The Pacs-1500 costs $1,129 from GTO Electronics, 430 Ritt St., St. Peter, Minn. 56082.

Word Processor Introduced For IBM Micros

MADISON, Wis. — A word processor for the IBM Personal Computer has been announced by Office Solutions, Inc.

According to the vendor, Officewriter can be quickly mastered and does not require complicated command sequences and lengthy training sessions.

All operations are initiated by pressing a single labeled key, and the processor provides all basic editing features along with functions such as document merge, headers, pagination and text transfer between documents.

Required for operation are 128K bytes of memory and two disk drives including a double-sided drive A. Officewriter will run on both the IBM Personal Computer and the IBM XT, according to Office Solutions.

The price for the word processor is $325.

Further information is available from Office Solutions, which can be reached through P.O. Box 5146, Madison, Wis. 53705.

Small Business Sector Seen Big OA Spenders in 1983

By Katherine Hafner
CW Staff

WEST HARTFORD, Conn. — The small business sector will spend an estimated $6.5 billion in 1983-1984 on computers and office automation software and hardware, predicted a study conducted by Focus Research Systems, Inc. here.

The study, titled "Small Business Automation — 1983," reviews how the U.S. small business community is using and purchasing office automation products and services.

With a focus on computers, word processors, copiers and service bureaus in particular, the report forecast that in the next three years over 900,000 small businesses intend to buy their first computers, more than tripling the number of small companies using computers. In addition, a predicted 143,000 units will be sold to existing users.

The authors of the study, which is based on more than 20,000 telephone interviews, define a small business as a company with fewer than 500 employees and under $25 million in annual sales.

'Small businesses that four or five years ago never thought of becoming automated are doing just that . . . currently, about 180,000 small businesses are considering purchasing a word processor.' — Focus Research Systems

The study found that the most lucrative market share lies in companies with less than 19 employees.

"Small businesses that four or five years ago never thought of becoming automated are doing just that," said John Worthen, executive vice-president of Focus Research Systems. Worthen attributes this to a combination of aggressive advertising and successful retail distribution.

"Now if you look at the number of small businesses planning to buy a computer in 1983, there are 203,000 in the one-to-19 category out of a total of 273,000 small businesses. The study helps to put in perspective the use of automation by small businesses. We draw on data from 1979, and we look at future uses of automation," Worthen added.

"For instance, it's absolutely clear that Apple [Computer, Inc.] and IBM remain the most prominent and are selling their personal computers at an amazingly rapid clip to small businesses," Worthen said.

Currently, about 180,000 small businesses are considering purchasing a word processor, according to the study. "Simplified computer technology and the computer retailing phenomenon have had a synergistic effect," the study noted, "creating a boom market for small computers.

"The recent changes in computer technology and distribution systems are driving the sale of computers to smaller and smaller companies," the report continued. "This downward push is reminiscent of the copier market of the mid-1970s. At that

(Continued on Page 64)

Lex-11 WP Software Enhanced With 'D' Language, Color Keys

SUDBURY, Mass. — EEC Systems, Inc. has announced Version 8A9 of the company's Lex-11 word processing and office automation software.

According to a vendor spokeswoman, the software has been rewritten in "D" language, allowing for easier implementation on a variety of processors.

Additional enhancements to the software include gold and blue keys, instead of escape and control, and automatic hyphenation, flexible line spacing and reverse video.

Lex-11 also contains a full screen editor, forms creation, mass mailing and a calculator.

It is available for Digital Equipment Corp. micros and minicomputers under all operating systems, as well as a number of other processors, including IBM and Altos Computer Systems, Inc. computers.

Priced at $850, Lex-11 is available from EEC Systems, 327/E Boston Post Road, Sudbury, Mass. 01776.

Dual-Interface Printer Unveiled

NEW CANAAN, Conn. — The Smith-Corona Group of SCM Corp. has introduced a dual-interface, letter-quality printer said to be compatible with most personal, home and small-business computers.

The Smith-Corona TP-II daisywheel printer features both RS-232 and Centronics Data Computer Corp.-compatible interface ports, a 10/12 pitch Ascii 93-char. printwheel, automatic carriage return, a programmable margin, a 256-char. buffer and automatic underscore.

Priced at $749, with an optional tractor feed attachment for $149, the printer is available from Smith-Corona, which is located at 65 Locust Ave., New Canaan, Conn. 06840.

Package Targets Book Production

SEATTLE — Scenic Computer Systems, Inc. has introduced a text processing package designed for use with any microcomputer using Softech Microsystem, Inc.'s operating system, P-System.

Sprinter-2 was designed to meet the demand of producing books, reports, manuals and other large documents, a vendor spokesman said. It verifies indexes, tables of contents, lists of figures and maintains forward and backward reference. Automatic numbering of chapters, sections and pages is also featured.

The package is available for $350 from Scenic Computer Systems, 14852 N.E. 31st Circle, Redmond, Wash. 98052.

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Net, Security Feature Added

Avalanche Net Systems Expanded

SAN MATEO, Calif. — Exo Systems Corp. has added a local-area network and password security feature to its Avalanche Networking Computer systems.

The Exo/Net local-area network and the password security features were designed for small to medium-size organizations as well as divisions and departments of large corporations.

The Exo/Net local-area network reportedly provides distributed processing with personal CPUs at each workstation with memory and optional local disk storage and printer. The Exo/Net system uses Carrier-Sense Multiple Access with Collision Detect and provides for record and file protection through password and lockout security features, according to a vendor spokesman.

The Avalanche computers range in price from $795 for the Model 100 to $7,995 for the Model 700. All prices include systems software for Exo/Net.

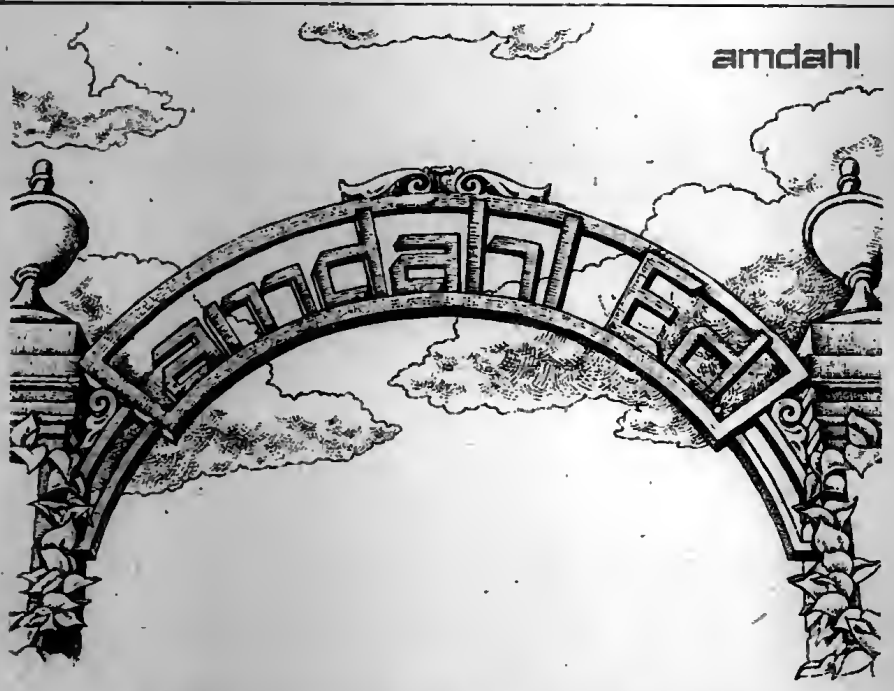
More information is available from Exo Systems at 951 Mariner's Island Blvd., San Mateo, Calif. 95504.

BSC Interface Capability Offered

NORTHRIDGE, Calif. — Totec has announced an IBM protocol Binary Synchronous Communications (BSC) interface capability for the IBM Displaywriter, as well as the IBM Office System 6 and 5520 word processing systems, for the vendor's TO-5000 optical character recognition system.

The TO-5000 system can reportedly read six fonts at once and 300 pages per hour at 300 char./sec. Up to six type styles can be read at one time without manual interchange.

The interface capability is priced at $500 above the product price of $9,995 from Totec, 19151 Parthenia Ave., Northridge, Calif. 91324.



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the amdahl phenomenon

In October 1970, a computer was formed expressly to build one product. A mainframe computer that would outperform the mainframe that owned the market at that time. Today this company is an international success story, a phenomenon.

Scribe Software Supports Xerox Printer

PITTSBURGH, Pa. — Unilogic, Ltd. has announced that its Scribe office automation software for drafting, formatting and printing documents now supports the Xerox Corp. 2700 distributed electronic printer.

Scribe operates on Digital Equipment Corp. Decsystem-10 and -20 mainframes and VAX-11 minicomputers, as well as Prime Computer, Inc. superminis and IBM mainframes. The software reportedly features automatic indexes, bibliographies and tables of contents.

It can produce mathematical and scientific notations and integrate charts, drawings and other computer-generated graphics into text, according to the firm.

The Xerox printer can be used for printing with distributed data processing systems, minicomputers and small business computers. The price for Scribe ranges from $4,000 per CPU to $50,000 per CPU depending on the processor; the printer costs $18,995.

More informatinn is available from Unilogic, 160 N. Craig St., Pittsburgh, Pa. 15212.

Office Tech Meet Set for Dec. 6-8

WILLOWDALE, Ont. — ICA Telemanagement, Inc. and Trigon Systems Group are sponsoring the Second Annual Conference on Office Technology to be held here Dec. 6-8.

"Implementing the Electronic Office" will feature presentations by experts in new technologies, including electronic mail, teleconferencing, local-area networks and corporate communications.

To attend the two-day conference on Dec. 7 and 8, registration before Sept. 30 is $445 and $495 after Sept. 30. To attend both the conference and seminars, the price is $540 before Sept. 30 and $600 after Sept. 30.

More information is available from ICA Telemanagement, Suite 210, 2175 Sheppard Ave. E., Willowdale, Ont. M2J1W7.

Study Predicts OA Spending Of Small Firms

(Continued from Page 63)

time, a few copier vendors introduced very elementary and inexpensive copiers. These lower cost copiers enticed hoards of small business buyers.

"Now the same phenomenon is happening with computers and, to a lesser extent, with word processors," the report noted.

The study pointed in particular to a "tremendous" market for automation in very small businesses, illustrated by the fact that nearly 80% of the buying plans come from companies with one to 19 employees.

The study costs $995 from Focus Research Systems, 342 N. Main St., West Hartford, Conn. 06117.

Larry Ellison

Oracle Head Reports Shift In Firm Focus

BOSTON — At the first international meeting of users of Relational Software, Inc.'s Oracle data base management system (DBMS) just over a year ago, company President Larry Ellison said he thought of himself as a professional programmer.

Today Ellison dubs himself a marketing manager at the head of a company that is still largely composed of professional programmers.

The shift in attitude reflects the interest that Oracle, and relational DBMS in general, have created. In the past year, Relational Software has been renamed Oracle Corp. after its flagship, snd its full-time staff has more than doubled — as has the attendance at the international user meeting. Sales revenues doubled in 1982 and are expected to triple again this year, a spokeswoman said.

The company's success can be traced to several decisions made when Oracle was introduced in 1979.

Developers first chose to use use IBM's SQL as its front-

(Continued on Page 66)

Over DP Services Offerings

Adapso Files Petition With SEC

By Bill Laberis
CW Staff

WASHINGTON, D.C. — The Association of Data Processing Service Organizations, Inc. (Adapso) has pressed its case further against the Big Eight accounting firms with the recent filing of a petition with the U.S. Securities and Exchange Commission (SEC), *Computerworld* has learned.

The petition, filed Aug. 4, asked the SEC for a more definitive ruling relating to the ability of accounting firms to offer DP services and products to their audit clients. Adapso has for years maintained that a certified public accountant (CPA) firm's offering of DP services to its audit clients constitutes a violation of SEC and Federal Trade Commission (FTC) regulations designed to ensure the integrity of external audits.

'Arthur Andersen & Co . . . garners more than $250 million per year selling DP services to its audit clients and others, about half the computer service sales gained by the remaining members of the Big Eight [accounting firms].'

Although none of the Big Eight firms is mentioned by name or as a collective entity in the petition, it is clear from Adapso's long-standing gripe with the Big Eight that these firms are the focus of the petition.

An Adapso spokesman said the SEC is not bound by any specific time limit to respond to the petition, but added that the matter should be clarified "within a few months."

Meanwhile, sources said that Adapso is continuing to compile background information for a lawsuit it may file against one or more of the Big Eight companies. The work, being conducted by Adapso's general counsel office with the input of some of Adapso's 575 member companies, focuses in great part on the activities of Arthur Andersen & Co. Andersen, Adapso believes, garners more than $250 million per year selling DP services to its audit clients and others, about half the computer service sales gained by the remaining members of the Big Eight.

However, a source said that any legal filings against Andersen or the Big Eight collectively by Adapso will likely await the outcome of the petition filed this month with the SEC.

Adapso's decision to carry its case to the SEC comes at a time

(Continued on Page 66)

Report Critiques State Of Business Graphics

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — The concentration by computer graphics vendors on technological advantages rather than user applications needs has resulted in a serious lack of credibility in the industry.

This is just one of a number of criticisms in a recent report, "Emerging Markets for Business Graphics," published by Creative Strategies International.

The 94-page report said that the market for business graphics is confused, chaotic and still in an early stage of development. "One major obstacle to market growth is the classic 'marketing myopia' exhibited by a number of vendors in their orientation to technology-based marketing strategies rather than user-applications-oriented strategies," it stated.

(Continued on Page 68)

Vector Graphic Reports Loss For Second Consecutive Quarter

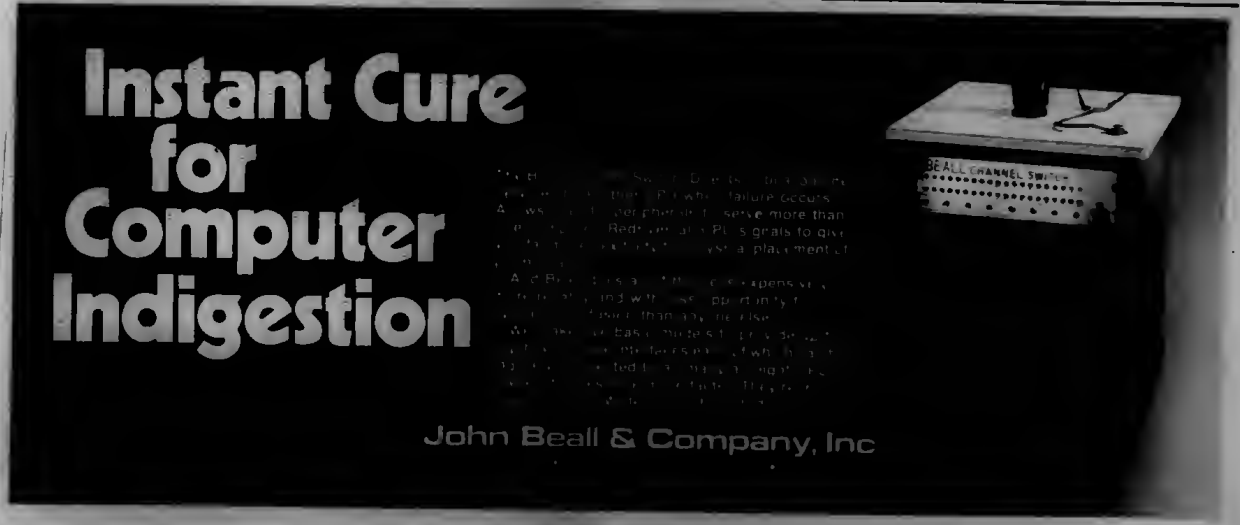
THOUSAND OAKS, Calif. — Citing increased operating expenses and stiffer competition across its product line, Vector Graphic, Inc. last week reported its second consecutive quarterly loss, as well as a net loss for its 1983 fiscal yesr.

For the year, the company lost nearly $3 million or 51 cents per share, compared with earnings of $2.3 million or 43 cents per share last year. Total sales for the year dropped 7% to $33.6 million, compared with sales of $36.2 million in 1982.

For the fourth quarter, the company lost $1.6 million or 29 cents per share, compared with a $252,000 or 4 cents per share loss the same period a year earlier. Revenues in the quarter sank nearly 14% to $7 million, compared with sales of $8.1 million.

A spokesman said, "We experienced a combination of internal and external factors, including a worldwide

(Continued on Page 76)



Relational DBMS Spearheads Oracle's Growth

(Continued from Page 65)

end user interface. Oracle later established a goal of portability across virtually all hardware.

The farsightedness of those decisions has been borne out by IBM, which chose SQL as the retrieval language for its recently announced DB2 relational DBMS, and by the growing attention software vendors are now giving to the portability issue.

Oracle also chose a bottom-heavy organizational structure in which "professional programmers should be professionals and not have to worry about managing," Ellison said. Oracle programmers are paid from 50% to 100% more than the industry average, he added.

The new interest in relational DBMS is evidenced by recent announcements by IBM and Cullinet Software, Inc., which plans to release a relational version of its network-based IDMS product early next year. However, relational announcements by traditional DBMS suppliers will not easily be backed up by action, Ellison said.

"Some companies who have written in assembler and invested heavily in IBM are now trying to go relational," he said. "We call them 'born-again' relational. But if you've written in IBM assembly language, there's no way to go across without rebuilding the software, and that can take years."

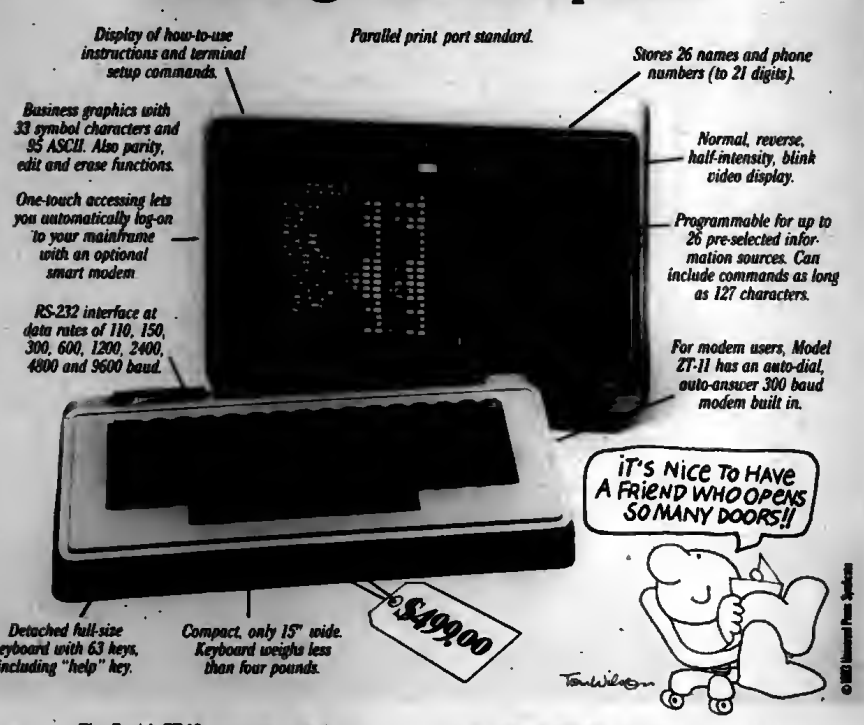
Oracle's DBMS is composed of about 2,000 modules written in C and designed to run on nearly any machine with a C compiler. Transporting to a new operating system requires changing 30 modules, and going to a new network means changing only 15 more, he said.

Such portability is the key to the micro-mainframe link, Ellison said. That is the arena in which Oracle expects to compete with DB2. "Oracle runs on a full range of minis and micros, including [ones that are] Unix-based and [Motorola, Inc.'s] 68000," he said.

"Because you have identical software running on a variety of hardware, that makes networking much easier," according to Ellison.

Ellison also dismissed the common criticism that relational DBMS is necessarily less efficient than network or hierarchical models. "There's theoretically no reason why it shouldn't run as fast," he said. "Relational has zero to do with how data is stored, and that's what determines performance."

There's a lot to like about the new Zenith ZT-10, starting with the price.



The Zenith ZT-10 represents a major advance in data access terminal engineering. And a major break-through in price/performance.

With the ZT-10 you get an RS-232 port and DEC VT-52 compatibility. Teamed with any Zenith green or amber video monitor, the ZT-10 is perhaps the lowest cost 9600 baud ASCII terminal yet.

Best of all, this terminal-in-a-keyboard actually gives you more for less. Great access power, for instance. With its menu table and single master key you've got one-touch access to mainframes, minis, micros—and any VT-52 terminal system!

Behind the ZT-10 and every Zenith product is our regional distribution network. This assures you the best in service and support, as well as the fastest possible delivery.

For more information about the ZT-10 and our complete line of video terminals, desktop computer systems, monitors, peripherals and software, see your nearby Zenith Data Systems distributor. Or call (800) 323-5924. In Illinois, call collect (312) 391-8861.

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Nominees Sought For Tech Medal

WASHINGTON, D.C. — The White House Science Office and the Commerce Department are seeking nominations for a new National Medal of Technology to honor people and companies who have used science and engineering to develop new products or processes.

Presidential Science Advisor G.A. Keyworth II said "the president is eager to recognize innovators in technology who have helped America compete successfully in the international marketplace."

Nominations for the medal will be accepted by the Commerce Department from Sept. 1 to Nov. 30, 1983. Instructions and nomination forms are available from the assistant secretary for productivity, U.S. Department of Commerce, Washington, D.C. 20230.

Adapso Battles CPA Firms With Petition

(Continued from Page 65)

of growing resentment toward the Big Eight from several Adapso members.

At Adapso's spring meeting last May, the CPA Relations Committee voted overwhelmingly to file an unfair competition suit against Andersen, a vote later rescinded by Adapso's Executive Committee [CW, May 16].

The organization decided instead to step up lobbying efforts at both the SEC and FTC, in part to avoid a protracted legal battle with any of the Big Eight firms.

Conservative Commission

But in going to the SEC, Adapso will be facing the same relatively conservative commission it faced in 1981.

At that time, the commission rescinded a previous SEC ruling that had appeared to limit the scope of the CPA firms' activities relating to the sale of DP services.

As all this activity has swirled, Adapso and its member companies have labored under the reality that many of their customers are themselves CPA audit firms, the biggest of which are the Big Eight. Therefore, Adapso and individual companies have pursued private negotiations with several CPA firms, seeking to reach some compromise solution to the matter.

With Rising Tide of Investment Capital

Entrepreneurs Moving Into High-Risk Ventures

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The rising tide of investment capital in the computer industry is giving would-be entrepreneurs greater discretion than ever before in how to fund their start-up companies.

According to recent estimates, a record $1.8 billion was invested by venture capital firms during 1982, of which almost 70% went to computer, communications and electronics-related businesses.

What all that activity means, according to Jim Lally, a partner in the San Francisco-based venture firm, Kleiner, Perkins, Caufield & Byers, is that investors are increasingly putting their money into higher risk ventures, with more enterprises now being financed.

"There is much more money available today in the venture capital market, which makes it a lot easier for a new business to find a backer," he asserted.

Two Main Strategies

Data processing professionals who go into business on their own have two main financing strategy choices. One is to raise enough money in the initial round to finance the company through the research and product development phases into production and achievement of a certain sales or profitability goal.

According to John Mumford, president of Crosspoint Financial Corp., an investment firm based here, this strategy requires more initial funding and presents a higher risk to investors. To compensate for this, investors typically require a higher rate of return and therefore a larger percentage ownership of the company.

One company that has successfully adopted this strategy while maintaining a controlling interest in the enterprise is Trilogy Ltd., founded by Gene Amdahl, who also founded Amdahl Corp. Established to design and manufacture high-performance, IBM-compatible, general-purpose computer systems, Trilogy raised $160 million in investment capital within a year of its incorporation and without a product on the market. Recently, the company concluded investment deals totaling $68 million with Sperry Corp. and Digital Equipment Corp. in return for sharing a yet-to-be-market-tested technology with them.

Explained a Trilogy spokesman: "Because of the need to create a single-purpose enterprise and in order to reduce the variety of risks which the company will face, it was critical that capital sufficient to fund the company's program of development be raised at the outset."

Citing the importance of a sound investment strategy, Amdahl added, "One of the major contributors to uncertainty and risk in building new companies is the financing. Many start-up companies have gone under because they have not had sufficient money to bring the product to market. By financing our company at the outset, we have been able to do things the way we feel they should be done and attract key managers who will not move without some guarantees of security in their new jobs."

For start-up firms that do not have the clout of a Gene Amdahl, however, going for vast amounts of capital at the beginning of their development is unrealistic.

For these entrepreneurs, the second and most popular strategy is "staged financing" — a process of timing each stage of the financing to coincide with the achievement of a significant milestone which represents a "step down in risk" and, therefore, a higher valuation on the company.

Walker Interactive Products, Inc., a supplier of financial applications software, has successfully attempted the staged-financing strategy, raising almost $17 million in three rounds of financing since its inception in 1981. "A key part of our strategy is to plan ahead for more capital financing should we need it. In this regard, it is important to establish a working relationship with investors," explained Jeffrey Walker, company chairman.

There are potential disadvantages to the staged-financing strategy, however. According to Lally, firms adopting this approach take the risk of running out of money at a critical time in their development.

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The Interactive Systems/3M Multiplexer for IBM 3274 Controllers

Now you can increase the number of IBM terminals in your office without increasing the number of baseband cables in your building.

Until recently, there was just one way to connect more than one IBM 3270-type terminal or printer to a 3274 Controller: install another dedicated cable for each new peripheral.

Now there's another, simpler, and very reliable way to do the same job without pulling long lengths of new cable. It's called the Interactive Systems/3M Series 6600 for IBM 3274 Controllers. It lets you use any single existing RG-62U cable to support as many as 32 separate terminals or printers.

In this typical IS/3M baseband system configuration, one Series 6600 Multiplexer is connected to an IBM 3274 Controller's 32 ports and another is placed near 32 clustered IBM Series 3278/9/87 terminals. A single length of existing RG-62U cable carries data between the two multiplexers over a distance of half a mile or more.

Installation is quite simple. One or more IS/3M Series 6600 head-end multiplexers is attached to the controller. Depending on the model, a single MUX can handle data for up to 6, 16, 24, or 32 ports.

The Series 6600 Multiplexer uses time-division multiplexing (TDM) to squeeze the data channels onto the single standard baseband cable.

The multiplexed data streams are carried via the existing cable to an identical Series 6600 MUX at the remote location. Local baseband cables distribute data between this multiplexer and its assigned terminals and printers.

Flexibility, plus uncompromised system performance.

Any combination of IS/3M multiplexers can be used with the IBM 3274 Controller, so long as the total number of channels doesn't exceed 32. For example, four 8-channel MUXes could be used with existing cables to feed up to eight terminals and/or printers at each of four different sites.

The IS/3M baseband system is fully transparent and plug-compatible to IBM equipment and most look-alikes.

Just as important, it allows all peripherals to send and receive data at the standard IBM channel speed of 2.3 Mb/s. The system is FCC Part 15 approved and U.L.-listed. It is available for either purchase or lease.

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Time-division multiplexing has been employed successfully in long-distance telephony and computer time-sharing for years.

Interactive Systems/3M is not a newcomer to data communications. On the contrary: more than 300 factories, office buildings, universities, and government installations have benefited from IS/3M's engineering, manufacturing, and installation expertise since 1972.

IS/3M's national service organization provides local support for the system.

Phone (800) 328-1684 toll-free (in Minnesota (800) 792-1072) or mail the coupon for more data on the Interactive Systems/3M Series 6600 Multiplexer. Who knows? You may never have to pull a major length of baseband cable again.

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Graphics Market Seen Ignoring Users Needs

(Continued from Page 65)

The real issue in marketing business graphics, the report asserted, is not demand for products based on specific technologies, but for products that can accomplish particular tasks and meet applications needs determined by the user.

Business graphics, the report continued, has achieved neither widespread acceptance by nor credibility with potential users. "If this market is to realize its potential, vendors must find ways to educate potential users to the value of business graphics as a productivity tool.

"If major computer manufacturers dominate distribution and marketing channels, but undertake no adequate user-education strategy, the effect on the business graphics market will be disastrous and it may never expand significantly," the report warned.

Key to Expansion

The key to expansion, the report stated, will be the introduction by IBM, Digital Equipment Corp. or other big firms of a general-purpose terminal with graphics capabilities, significant local intelligence and compatibility with existing minicomputer or mainframe systems. Other display manufacturers and vendors will then find their niches around the market maker or makers, it explained.

However, the report predicted, 1984 will see a shakeout of hardware, systems and software vendors as leading computer manufacturers increasingly dominate the market. The report forecasts the independent business graphics software market to grow at an annual compound growth rate of 43.7% over the next four years, reaching $237 million in 1987.

"Volume of demand will be spurred by improved economic conditions, increased user acceptance of business graphics, more user-friendly and flexible software and more sophisticated operating systems available for 16-bit microcomputers. Data base access will show significant improvement as vendors develop better links between existing software and user data bases or as data base management systems increasingly incorporate graphics options."

A Different Future

Business graphics, the report added, will cease to be a distinguishable hardware or systems market. Rather, it will be subsumed into future office systems using integrated graphics workstations in a local-area network or as multipurpose terminals connected to a host.

"Business graphics will be one of many capabilities of such systems, not the principal justification for them," the report concluded.

"Emerging Markets for Business Graphics" is available for $1,450 from Creative Strategies International, 5uite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

	1982	1983	1984	1985	1986	1987	CAGR*
Units Shipped	65,990	tt4,780	162,680	238,750	3t0,780	404,080	43.7%
Revenues (thousands)	33,633	58,850	94,180	t30,800	t70,t00	237,430	47.8%

* CAGR — Compound Annual Growth Rate

Creative Strategies International

Software Market Forecast for Independent Business Graphics

CAN YOU FIND THE IBM* 3278 HIDDEN IN THIS PICTURE?

It's right there.

Inside the Advanced Personal Computer from NEC Information Systems.

In fact, the Advanced Personal Computer is the best personal computer for direct connect 3278 emulation, with 3274 and 3276 controllers.

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WITH A SINGLE KEYSTROKE, YOU CAN SWITCH FROM 3278 EMULATION TO A FULL FUNCTION PERSONAL COMPUTER.

And the APC is fully compatible with all 15 different 3278 keyboard configurations.

And it offers a full range of communications protocols, including SNA/SDLC, asynchronous and bisynchronous.

A MAJOR INSURANCE COMPANY IS USING THE ADVANCED PERSONAL COMPUTER TO GREATLY INCREASE WORKER PRODUCTIVITY.

Magnuson Secrets Case Goes to Closed Session

SAN JOSE, Calif. — The civil case involving Paul Magnuson and allegations that he stole trade secrets from the company which he founded, Magnuson Computer Systems, Inc., went into closed session last week.

Citing the need to protect the proprietary interests of various companies involved in the case, Municipal Court Judge Gerard Kettmann agreed to bar the press and public from the preliminary hearings, which will determine whether Magnuson will face a criminal trial in Superior Court.

According to Deputy District Attorney Douglas Southard, the judge gave three reasons for his decision. The judge wanted to ensure a fair trial in which potential jurors would not be influenced by the publicity surrounding the case; to ensure that trade secrets belonging to Magnuson Computer Systems, its suppliers and the defendants are not disclosed; and to ensure that witnesses are not inhibited in their testimony by the presence of reporters and potential competitors.

The decision was immediately attacked, with one local newspaper here applying for a writ in Superior Court to overturn the ruling.

Paul Magnuson, together with Samuel Dottle, former director of software development at Magnson Computer Systems, and Kevin Anderson, another former employee, are accused of illegally copying magnetic tape used by Magnuson Computer Systems with the intent of using it in their new start-up venture, Prodigy.

Prodigy has subsequently gone out of business.

If convicted, the defendants could face up to six years in prison.

Own for less than you pay in rent.
With all this functionality, you'd probably expect to pay a small fortune for the APC. Surprise! The APC can be purchased for less than 1 year's rental charges on a 3278.

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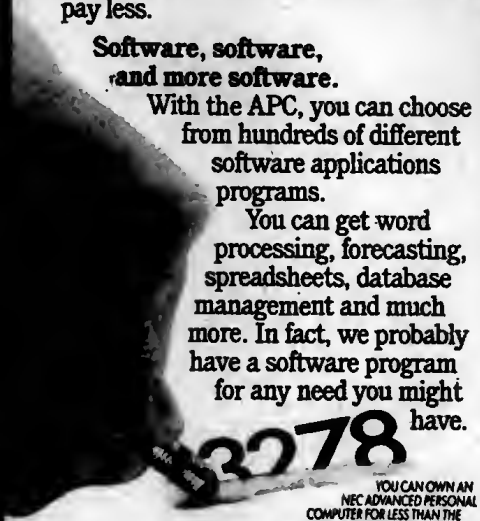

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Wang Offers Incentives To Vendors

LOWELL, Mass. — Wang Laboratories, Inc. has announced two programs designed to enhance the company's relationship with its network of independent software vendors by offering them incentives to continue application program development for Wang systems.

The marketing assistance program entails a one-year contract during which payments of predetermined rates will be made to the software vendors whose software products were a major factor in Wang hardware purchases. At Wang's discretion, vendors will qualify for the program based on their application software offerings and ability to provide pre- and post-sale suport.

Based on the size of the sale, payment rates range from 5% to 10% for system 2200 sales, and 2% to 5% for VS hardware sales, the company said.

The OIS software vendor program will identify vendors offering value-added application products and support services to Wang's OIS customers, encouraging the development of application software and assisting in promoting OIS application software through traditional Wang channels.

Qualified vendors will benefit by the availability of a 40% discount on hardware systems to be used for software development and customer support, a 20% discount on supplies and a 40% discount on Wang training courses.

Wang is located at 1 Industrial Ave., Lowell, Mass. 01851.

Codex Cleared Of Infringement

MANSFIELD, Mass. — Codex Corp., a subsidiary of Motorola, Inc., has announced that a U.S. Court of Appeals in Boston has upheld a lower court's decision, clearing the company of patent infringement charges brought by Racal-Milgo, Inc.

The lower court had ruled that Racal-Milgo patents involved in the litigation were invalid and that the inventor of the patents in question and Racal-Milgo's attorney had "deliberately misrepresented" facts in the case. Racal-Milgo was ordered to pay attorney's fees to Codex.

UniPress Reason No. 2
—UniCalc—
UniPress Software, Inc.

Executive Corner

• **Bob Nachtrieb** has been elected chairman of the board, and **Jim Thomason** has been elected president of Fotel, Inc.

• **John J. Reis** has been appointed president and chief operating officer of Telesciences, Inc.

• **C. Michael Armstrong**, vice-president and group executive for the information systems and communications group of IBM, has been elected to the board of directors of Rolm Corp. He is the first of two IBM representatives to be elected to the Rolm board in accordance with a June agreement between IBM and Rolm.

• **Michael J. King** has been appointed president and chief operating officer of Computer Entry Systems Corp.

• **Daniel C. Shea** has been promoted to president of Rolm/Northern California.

• **John J. Douglas** has been appointed president and chief operating officer of Docutel/Olivetti Corp.

• Three ITT executives have been elected to the board of directors of Tulin Corp. They are **Dr. Steward Flaschen**, senior vice-president and technical director; **Dr. Sang Lee**, director of organization; and **David Lee**, president of Qume Corp., an ITT subsidiary.

• **Otis Brinkley** has been elected an officer of Tymshare, Inc. and group vice-president of the firm's information network services business.

• **Lawrence H. McGovern** has been appointed vice-president of operations at Omnidata.

• **John T. Maske** has been named corporate vice-president, manufacturing and service, at Prime Computer, Inc.

• **Harrison F. Longstreth** has been named vice-president of sales for Corvus Systems, Inc.

• **Willard F. Lochridge** has been appointed vice-president of federal systems for Grid Systems Corp.

• **Roy L. King** and **Harry L. Eberly** have been appointed executive vice-presidents of Telex Computer Products, Inc.

• **Frank Washington** has been appointed vice-president and general manager for Videotex America.

• **Richard P. Taylor** has been named vice-president of quality and reliability at Quantum Corp.

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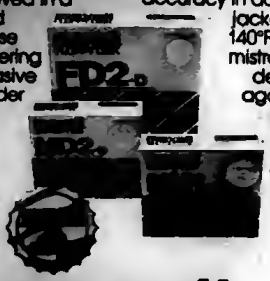
What distinguishes a Maxell floppy disk? Improvements great and small, achieved in a decade of innovation. We developed unique, uniform crystals to assure dense oxide packing. Intensified the calendering process to minimize the need for abrasive burnishing. Created an improved binder and lubricant. And a new jacket design that leaves industry standards in our wake.

It would require photomicrographs to make some of these improvements observable. On the job, the advantages become obvious. Resolution enhanced by 20% creates a cleaner signal output. And guarantees the read/write accuracy in double-density applications. New jacket construction, heat-resistant to 140°F, extends disk use without risk of mistracking. In effect, durability is redefined. And in accelerated tests against the most respected names in the industry, Maxell sustained the highest and most consistent output over time.



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Nickels & Dimes

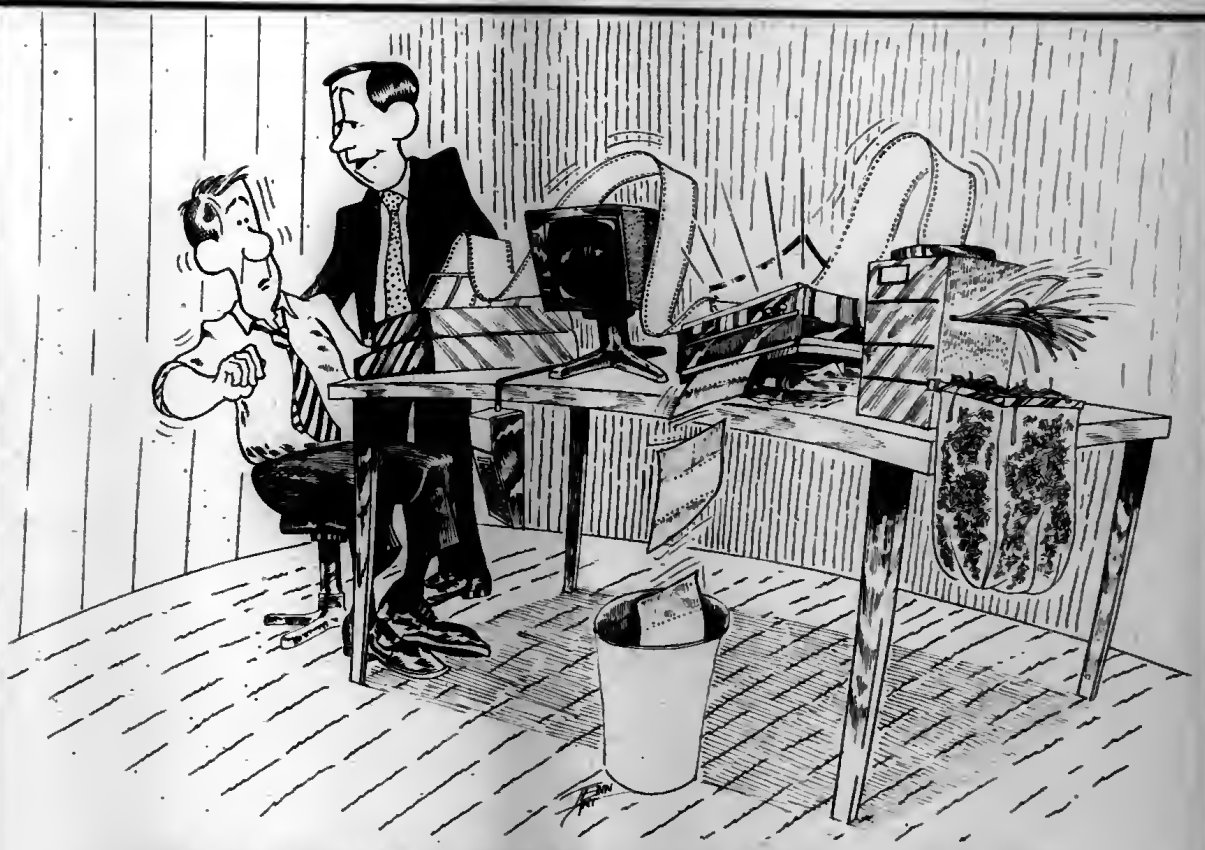
Convergent Technologies, Inc. plans to file a registration statement covering the sale by NCR Corp. of 834,444 shares of Convergent Technologies common stock.

$$$

Wicat Systems, Inc. has announced operating profits of $811,000 on revenue of $8.9 million for the first fiscal quarter ending June 30, compared with an operating loss of $2.7 million on revenue of $2.5 million for the first fiscal quarter of last year.

$$$

On-Line Software International, Inc. has reported a 34% increase in revenues and a 52% increase in net income for the fourth quarter ended May 31. For the year ended May 31, revenues increased 48% to $20.1 million from last year and net income $2.5 million, up 40% from $1.8 million.



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After compiling all your important data, the big question is how to disseminate and store it? Do you display and print it graphically? Fax it to satellite offices? Store it on microfilm? Or send it via intelligent copiers? These questions and more will be answered in the next issue of *Computerworld OA.*

Our next OA Focus section looks at business graphics, intelligent printers, video disks, OCR, micrographics, copiers, computer-assisted retrieval, facsimile and records management. We will address market activity, user planning and new products.

In addition to the OA Focus on User Output Technology, *Computerworld OA* will feature articles on topics such as ergonomics, teleconferencing, desktop computers, productivity applications, and vendor and user case histories.

In every issue of *Computerworld OA*, we'll keep you informed and current in all aspects of office automation with articles on new technologies and trends, and overall OA strategies. And, we'll take a closer look at a key issue in our OA Focus section.

If what's happening in office automation is important to you for your planning and purchase decisions, you'll want to read the next issue of *Computerworld OA*. The issue date is October 12. (Advertising close is September 2, materials due one week later.)

For advertising information on *Computerworld OA* and the people who read it, call Don Fagan, VP Sales/Marketing, toll-free at 800-343-6474 (in Mass. 617-879-0700) or your local *Computerworld* sales representative.

Computerworld OA:
We're writing the book on office automation.

Two Firms to Market Integrated CAD/CAM

IRVINE, Calif. — A joint marketing venture to supply integrated computer-aided design and manufacturing (CAD/CAM) systems has been announced by Tektronix, Inc. and Manufacturing & Consulting Services, Inc. (MCS).

The systems will consist of Tektronix interactive graphics displays, hard-copy devices and ink-jet printer/plotters married to the MCS Anvil-4000 CAD/CAM software and the Anvil-3000D computer-aided design and drafting (Cadd) software.

The products will be offered on both the Data General Corp. and Digital Equipment Corp. lines of computers. MCS will have the responsibility for overall systems integration and sales, and both Tektronix and MCS sales organizations will introduce the systems to new customers.

Systems will range from a low-end Cadd system combining Tektronix 4107 color display, table, adjustable stand and 4695 ink-jet color copier coupled with a Data General Desktop Generation computer and Anvil-3000D for $38,500 plus options. At the high end is a complete 24-station, color Tektronix display and Anvil-4000 system priced at under $30,000 per station.

ERGONOMICS STANDARDS AND LEGISLATION IN EUROPE

If your company is competing in the European computer equipment market - or thinking about it - understanding and abiding by European ergonomics standards and legislation is a pre-requisite for success.

This one-day seminar will review in detail the most important standards and regulations currently in force and planned in Europe. Key speaker will be the chairman of the German committee that drafted that country's Safety Regulations, the most important set of ergonomic guidelines issued to date in Europe.

The seminar will happen in Los Angeles on October 31st, and in Boston on November 2nd. It is co-sponsored by The Koffler Group, System Concepts Ltd (London) and The Ergonomics Newsletter.

For registration information contact: Sandi Nelson, Seminar Manager
The Koffler Group, 3029 Wilshire Blvd., Santa Monica, CA 90403
213/453-1844

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TI Acquires 25% Interest In LMI

CULVER CITY, Calif. — Texas Instruments, Inc. has acquired a 25% equity interest in Lisp Machine, Inc. (LMI), LMI President F. Stephen Wyle said recently.

Under the agreement, LMI is supporting TI in the development of advanced hardware and software for systems based on the Lisp programming language developed by MIT.

The Lamda Machine, what LMI termed its next-generation computer intended for artificial intelligence (AI) research and applications, employs the TI Numachine.

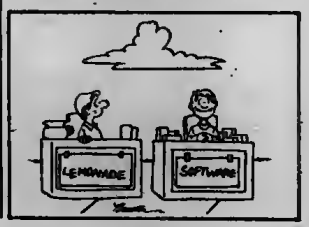
Lisp has become used increasingly in AI environments and is considered "the language of choice" by many AI researchers, the two companies claimed.

Court Approves Reorganization Of CCI

TORRANCE, Calif. — U.S. Bankruptcy Court has confirmed a plan of reorganization of Computer Communications, Inc. (CCI), discharging the company from the Chapter 11 proceedings it filed in November of 1980, according to Raymond High, company president and chairman.

The court ruled in favor of a plan that provides $10 million to the company through the issue of new shares. The proceeds of the sale, after payment of priority claims and administrative costs, are to be used to pay creditor obligations.

A plan rejected by the court involved the purchase of 80% of CCI by Data-Design Laboratories, Inc.



The Executive Microcomputer Conference and Exposition is coming to the Long Beach Convention Center on October 5-7.

October 5-7 1983

The computer show designed with you in mind! At the EMCE Conference Program you can learn in three days what could take three months.

Whether you're a DP/MIS Manager, a novice business computer user, vendor or entrepreneur, the EMCE Conference program will provide you with the information you need to make the most prudent and cost-effective software and hardware decisions for your needs.

The Two Day Conference Program

THURSDAY, OCTOBER 6, 1983

7:45 - 8:45 a.m.
EYE OPENER: The Personal Computer in Communications
Dr. Larry Magid, *Executive Vice President,* Know How, Inc.

9:00 - 10:00 a.m.
KEYNOTE: The Micro/PC Industry: IBM Domination & Future Directions
Adam Osborne, *Chairman of the Board,* Osborne Computer

10:00 - 11:00 a.m.
The Executive/Professional Workstation
John Crudele, *Sr. Manager,* Management Information Consulting, Arthur Andersen & Co.
Software for Engineering Users
Abi Runchal, *President,* Analytic and Computational Research, Inc.
Channels of Distribution for Microcomputers
Jim Finke, *President,* Internetworx, Inc.

2:00 - 3:00 p.m.
Spreadsheet/Financial Applications
Laurence Press, *President,* Small Systems Group
The Micro-Mainframe Connection
Dick Andersen, *Director,* AM/MS
Charles Bornheim, *Principal,* AM/MS
Packaging & Documenting Software
Howard Zack, *Marketing Communications Manager,* VisiCorp

3:10 - 4:10 p.m.
The Future of Business Graphics
Dr. Irwin Jarrett, *Chairman and CEO,* Fingraph Corp.
The Engineering/Technical Workstation
The Personal Computer After Market

4:20 - 5:30 p.m.
Micros and the Changing Role of MIS
Dr. Michael Hammer, *President,* Hammer & Co., Inc.

FRIDAY, OCTOBER 7, 1983

7:45 - 8:45 a.m.
EYE OPENER: Information Utilities for Personal Computing
Fran Spigai, *President,* Data Base Services

9:00 - 10:00 a.m.
KEYNOTE: The Fifth Generation Workstation & Artificial Intelligence
Pamela McCorduck, co-author, "The Fifth Generation, Artificial Intelligence and Japan's Computer Challenge"

10:00 - 11:00 a.m.
Word Processing for Micros: The Next Step
John Murphy, *Vice President,* Advanced Office Concepts Corp.
Networking Microcomputers in the Corporate Environment
Arnold M. Roberts, *Consultant,* ADC Associates
Delivering Good Training and Support to the Corporate User
Karen Orton, *Vice President,* National Training Systems

2:00 - 3:00 p.m.
The Information Resource Center
Tom Kosnik, *Researcher,* Stanford Business School
Portable Computers for Professionals
Doug Mosher, *Division Manager,* Sybex, Inc.
How to Raise Venture Capital
Moderator: Melody Johnson, *Securities Analyst,* Cable, Howse & Ragen
Panelists: Tom Cable, *Partner,* Cable, Howse & Cezadd

3:10 - 4:10 p.m.
Defining Integrated Software
Fred Gibbons, *President,* Software Publishing
DBMS on Microcomputers
Scott Kuklin, *Executive Vice President,* Helix Corp.
Selling to the Corporate Account: Problems & Pitfalls
William H. Luden, *President,* ComputerEase

4:20 - 5:30 p.m.
The Role of Microcomputers in Business
Richard L. Willmarth, *Manager,* Office Systems, Storage Technology Corporation

Four "In Depth" Tutorials

Wednesday, OCTOBER 5 from 9:00 a.m. - 5:30 p.m.
EMCE's "In Depth" Tutorials are all day seminars for managers who need a comprehensive understanding of one of the topics outlined below. All tutorials include two coffee breaks and a complete course notebook with reference materials. The tutorials will be held at the R.M.S. Queen Mary, Long Beach, CA.

How to Select a Business/Personal Computer (T1)

• How to Select the Features You Need • Determining What Size Computer You Really Need • What to Look For — and Look Out For — In Your Hardware and Software • How to Determine What To Spend • How to Select The Right Software Package For You • How to Simply Define Your Computer System Requirements • How to Minimise Costly Professional Help • How to Select the Best System and Suppliers

Course Instructor: Arnold M. Roberts, president of ADC Associates brings to the tutorial extensive experience in seminar leadership having presented tutorials to managers across the country in the areas of data base management, networking and other application specific areas.

Microcomputers and Local Networks (T2)

• Overview of Networking and Definitions • Hardware Issues • Interconnection Technologies • Microcomputers and Components • Software Issues including Operating Systems • Centralization vs. Decentralization • Equipment and Systems: A look at Network Models • Technology Trends and Future Directions

Course Instructor: J. Scott Haugdahl is a systems specialist at Architecture Technology Corporation, Minneapolis, Minnesota, a consulting firm specializing in computer architecture, including local networks and office systems.

UNIX Tutorial for Managers (T3)

• The History of UNIX • UNIX — The Product • Dynamics of the UNIX Marketplace • Overview of Available UNIX Products • Comparison of Hardware Systems • A look at Application Software • The Capabilities and Limitations of UNIX

Course Instructor: Jean Yates, president and associate of Yates Ventures specializing in researching UNIX systems, applications and the growing UNIX marketplace. Yates Ventures has been involved in extensive laboratory testing of UNIX related products and has been credited with producing 5 books on the subject.

Business Graphics for Managers (T4)

• Assessing Your Hardware Requirements Including Printers, Plotters and CRT s • Assessing Your Software Requirements Including Operating Systems and Interfaces • Evaluating Current Business Graphics Software • Developing and Using Business Graphics Software • Producing Pie and Bar Charts • Understanding Program Compatability • Creating Presentations with Graphic "Slide Shows"

Course Instructor: James Morrison, independent consultant and educator, has trained many people in the area of microcomputers. As a contributing editor to LIST software publication and newsletter, and an evaluation expert for the FIRST SOFTWARE, Mr. Morrison is a true professional in his field.

The Executive Microcomputer Workshop

Thursday, October 6 and Friday, October 7.
An intensive two-day session for the busy executive or professional who needs to learn the basics of using a personal computer in the least possible amount of time. You'll learn how to use the IBM PC and have concrete experience with Lotus' 1-2-3 integrated software package.

The workshop will be given in conjunction with National Training Systems (NTS), a leader in providing microcomputer training products and services to large corporations.

The Executive Microcomputer Workshop will be held at the Long Beach Convention Center. Register Early! Enrollment is limited.

NATIONAL TRAINING SYSTEMS INC.

Special No-Wait tours of the "Spruce Goose" — FREE

EMCE has arranged for after-hours tours of the world's largest airplane, Howard Hughes' famed "Spruce Goose." Tours will be held Wednesday and Thursday, October 5 & 6 beginning at 6:00 PM. You can pick up your free ticket(s) from any exhibitor on the show floor.

Win a Personal Computer

Here's your chance to win the MORROW MICRO DECISION (MD3), the complete desktop system for the small businessman and professional. Just go to the *InfoWorld* exhibit booth and fill out a ticket. You may be the lucky winner.

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- ☐ Friday Only, Conference Program & Exhibition $195
- ☐ Complete Three Day Package (includes tutorial, exhibits & full conference registration) $440
- ☐ Two-day Executive Microcomputer Workshop $595
- ☐ In Depth Tutorials Wednesday, October 5, 9:00-5:30 (select one only) $195
  - ☐ How to Select a Business/Personal Computer (T1)
  - ☐ Microcomputers and Local Networks (T2)
  - ☐ UNIX Tutorial for Managers (T3)
  - ☐ Business Graphics for Managers (T4)

  On Depth tutorials will be held at the R.M.S. Queen Mary, Long Beach, California)

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• Registrations cancelled later than September 21 are subject to a $60.00 service charge. Registrations may be transferred at no charge.

To insure advance receipt of your conference credentials, mail form before September 21, 1983, with check, credit card or P.O. payment to: EMCE, 375 Cochituate Rd., Box 880, Framingham, MA 01701

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EMCE Long Beach • Long Beach Convention Center • 300 E. Ocean Blvd. • Long Beach, CA • Oct. 5-7, 1983

Management, Drive Seen Key to Tech Start-Up

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — Strong management with exceptional credentials and an overriding motivation to succeed are essential ingredients for start-up companies in the high-technology field, according to a Silicon Valley-based venture capitalist.

John Mumford, president of Crosspoint Financial Corp., said that to be successful in attracting capital investment, start-ups in the computer sector should aim for management teams where each key member has had previous operating and profit responsibility.

These managers, he added, should be experienced in the industry, self-motivated, possess a sense of urgency and have a long-term commitment to the business.

Mumford, a former IBMer and management consultant with Peat, Marwick, Mitchell & Co., said start-up companies in the high-technology business face a difficult quandary, namely finding and compensating qualified marketing and management talent. At the same time, those able to do so possess unparalleled opportunities.

"The climate for raising venture capital has never been better, and an increasing number of entrepreneurs are launching successful companies in such fields as computers and electronics," Mumford said. Today there are some 2,000 venture capital investors in the U.S., many of whom specialize in high-technology businesses, he said. By comparison, Mumford noted, in 1975 only $10 million in private venture capital funding was raised.

In addition to a strong management team, he maintained, new companies in the computer industry need to demonstrate a number of other characteristics if they are to succeed in attracting venture capital. Their products must focus on growing markets that will support rapid expansion to build a company of significant size.

In addition, they must demonstrate distinctive product lines with a high degree of innovation or proprietary knowledge.

"One financing strategy is to try to raise enough money in the initial round to finance the company through the research and product development phases into production and achievement of a certain sales or profitability goal," Mumford continued. "This strategy requires more initial funding and presents a higher risk to investors. To compensate for this higher risk, the investors typically require a higher rate of return and, therefore, a larger percentage ownership of the company."

Index Lists Acquisitions

FORT LEE, N.J. — The cumulative dollar value of mergers and acquisitions in the $26 billion computer services industry was set at about $409 million in cash and stocks for the first six months of 1983, almost equal to the total for the year of 1982, according to a recent index.

The Association of Data Processing Service Organizations (Adapso)/Broadview Index recorded 60 acquisitions for the first half of the year, more than doubling the $201 million for 61 acquisitions recorded for the same period in 1982 and coming close to the $432 million recorded for the entire year of 1982.

According to the index, five acquisitions were valued at more than $20 million:

- Dun & Bradstreet acquired McCormack and Dodge Corp., a business applications software developer, for $50 million.
- Automatic Data Processing, Inc. (ADP) acquired GTE Telenet Information Systems for more than $20 million.
- Continental Corp. bought ADP's CPI Group, Inc. for $40 million.
- Martin Marietta Data Systems, Inc. purchased Mathematica, Inc. for $30 million.
- Scientific Software acquired Intercomp Development and Engineering for $28.5 million.

Despite Troubled Economy, CSI Study Says

Mexico Showing Signs of DP Market Growth

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — The computer industry in Mexico is undergoing an upswing in its fortunes despite that country's troubled economic condition, according to a study just released by Creative Strategies International, Inc. (CSI).

"Since 1981, import restrictions and devastating economic conditions have combined to nearly suffocate Mexico's once-booming market for mini and microcomputers," according to the report, "Mexican Small Computer Markets." "Despite increased demand and local production, the market fell sharply in both 1981 and 1982. But now there are signs of an upswing."

The report said the newly opened free exchange market and an austerity program approved by the International Monetary Fund have fueled hope that the computer market will grow and prosper despite recent political and economic developments.

'Waiting for Signs of Change'

"The industry is waiting for signs of change in local content rules and equity restrictions, while the new presidential administration sorts out its own priorities in the midst of near bankruptcy. In this volatile environment, international computer companies are forced to fix a long-term strategy for the Mexican market," the report explained.

Under the terms of regulations drawn up in 1981, overseas vendors are required to submit their plans for increasing the national content of finished computer products, including the setting up of manufacturing and assembly operations in Mexico [CW, Nov. 16, 1981]. Hitherto, many U.S. computer companies simply had sales offices south of the border and relied on importing computer equipment into Mexico.

In an attempt to boost its desperate shortage of foreign currency and to cut down on the level of imports, the government now requires overseas manufacturers to detail how and when they are going to comply with the new regulations. Microcomputer companies involved in the manufacture, assembly or selling of computers in Mexico, for instance, must now have at least 51% of their equity in the country to be Mexican owned.

To date, according to the CSI report, 36 companies have submitted development investment plans with the Mexican computer industry authorities, including IBM, Hewlett-Packard Co., Burroughs Corp., NCR Corp. and Apple Computer, Inc.

IBM and HP, for example, which according to CSI dominate the minicomputer market in Mexico, have both announced plans to set up manufacturing bases in Guadalajara. The HP operation manufactures HP 3000 business computers that are also exported to other Latin American countries in addition to supplying the domestic market.

"From the start, we have had an optimistic view of the long-term future of the Mexican computer market," a spokesman for HP said. "When the new government came to office at the beginning of the year, we adopted a wait-and-see attitude, and we think it has taken some positive steps to allow business to proceed."

The CSI report listed key areas of change affecting the computer industry in Mexico, including:

- A massive devaluation of the peso against the dollar, which has added to the country's foreign exchange difficulties.
- An enormous flight of capital out of the country as Mexico reeled under fast-dropping oil prices and mounting international debt. Currently the Mexican government is offering overseas investors an incentive to keep their money in the country. U.S. companies with Mexican subsidiaries can receive more favorable exchange rates in return for agreeing to delay debt repayments from subsidiaries to parent companies for a number of years.
- A change in government with most of the power resting in the hands of President Miguel de la Madrid.

IBM Purchases More Intel Stock

ARMONK, N.Y. — IBM has upped its stake in Intel Corp. with the purchase of an additional 1.8 million Intel shares, raising IBM's minority interest in that company to 13.7%.

The shares cost IBM approximately $71 million and were reportedly purchased over the past several months when Intel's stock price went from $32 to $44 per share. IBM paid $20 per share for its initial 12% stake in Intel.

IBM's original $250 million investment in Intel is valued today at more than $480 million. IBM gained a seat on Intel's board of directors with its minority stake and also gained access to some of Intel's technology as it relates to IBM products.

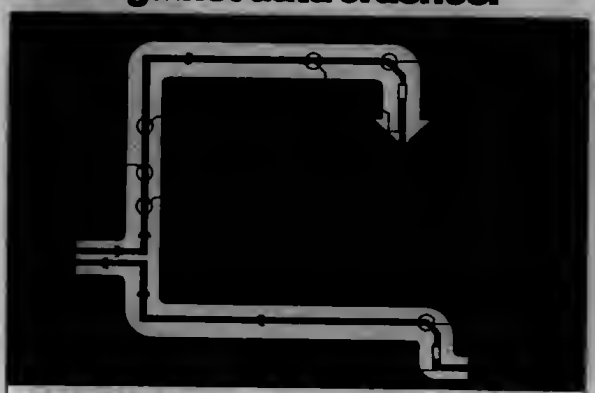
New from Interactive Systems/3M:

The first high-speed broadband local-area network that guards against data crashes.

If you've been thinking of investing in a contention network, consider this. How do you guard against data crashes during times of heavy system use?

Answer: You don't, because contention schemes simply don't provide any kind of data insurance.

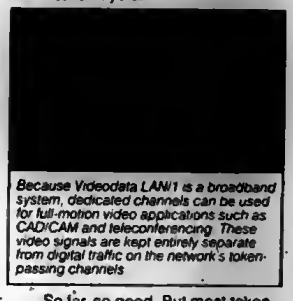
Fortunately, there is a new type of network that *does* protect against data loss. It's called 3M Videodata® LAN/1. And it's the first intelligent broadband local-area network that's designed to get data through on time, no matter how much traffic is on the cable.



In the Videodata LAN/1 network, messages can be sent from any terminal to any other without going through the host processor. Network Interface Units (NIUs) connect digital devices to mechanical taps (shown as small circles) on the main coaxial cable. A Network Monitoring Unit, or NMU, keeps a statistical record of network performance.

Videodata® LAN/1: The efficiency of token-passing plus the proven flexibility and expandability of broadband.

Token-passing networks eliminate contention troubles and data crashes by passing an electronic "token" from terminal to terminal. When a terminal has to transmit, it grabs the token and sends data packets to the receiving device. Receipt is acknowledged and the token is automatically released to continue its rounds. Because the system assigns a network entry address to each user, everyone has an opportunity to send data during each token cycle.



Because Videodata LAN/1 is a broadband system, dedicated channels can be used for full-motion video applications such as CAD/CAM and teleconferencing. These video signals are kept entirely separate from digital traffic on the network's token-passing channels.

So far, so good. But most token-passing networks are baseband systems, meaning that terminals must share a common channel as they would in a typical contention network. This can limit speed and capacity in some applications.

LAN/1 overcomes this possible limitation by combining token-passing with a proven *broadband* technology that allows many channels to be put on a single cable. The payoff: higher channel speeds, ranging up to 2.5 MB/s over a maximum seven-mile radius, with terminal data rates of up to 19.2 KB/s. Plus a capacity of up to 10,000 devices to allow plenty of room for future expansion.

Self-monitoring, with a printed record of network performance.

LAN/1 gives statistical proof of its own performance in printed form, thanks to a microcomputer-based Network Monitoring Unit (NMU). This unit, which also helps in routine maintenance and troubleshooting, may be used for remote monitoring as well.

Separate channels for voice, video, and graphics. Plus the ability to work in point-to-point applications.

Because LAN/1 is a broadband network, channels can be set aside for real-time voice, video, and high-speed graphics. This can be done without compromising digital traffic capacity.

LAN/1's broadband design also permits flexibility in network architecture, so that it can be used in high-speed point-to-point applications which can't be served efficiently with contention systems.

Other benefits include full transparency, an automatic shut-off feature to keep any one terminal from capturing the token, and compatibility with both dumb and intelligent terminals. The list of features goes on and on.

For the full story on the new Videodata LAN/1 network from Interactive Systems/3M, call 800-328-1684 toll free. (In Minnesota, 800-792-1072.) Or mail the coupon.

Mail to: Interactive Systems/3M CW 8/29
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Supershorts

Northern Telecom, Inc. will double its manufacturing capacity for digital central office switching equipment, investing $16 million in the expansion of its facility at Research Triangle Park, N.C. The project will add approximately 250,000 square feet and create about 1,000 new jobs.

• • •

Control Data Corp. has acquired a license from **Chang Laboratories, Inc.** to market Chang's business software products for personal computers.

• • •

Sun Microsystems, Inc., Mountainview, Calif., has signed a memorandum of understanding with **Computervision, Inc.** of Bedford, Mass., for a contract that would cover an exchange of technologies, cooperation in future product development and joint manufacturing of intelligent workstation products.

• • •

Memorex Corp. has expanded its Memorex Authorized Marketer (MAM) program with the addition of nine new participants. They are Leasing Dynamics, Inc., Cleveland, Ohio; Southwest Peripherals Co., Inc., Phoenix, Ariz.; Perpetual Systems, Inc., Boston, Mass.; General Systems Corp., Troy, Mich.; Computer Affiliates Co., Inc., Staten Island, N.Y.; Northwest Computer Marketing, Portland, Ore.; Printer Systems Corp., Gaithersburg, Md.; The Madera Group, San Francisco; and Manchester Equipment, Long Island, New York. The MAM participants market the Communication Group's data communication products compatible with IBM's System/34, 36 and 38, including the 2051 display station, and the 2056 and 3056 matrix printers.

• • •

McDonnell Douglas Automation Co. (McAuto) has acquired a substantial minority interest in **Sanus Corp. Health Systems,** a New York-based company established in March, 1983, to provide alternate health care delivery systems. Under the agreement, McAuto President Robert A. Fischer will join a board of directors which includes Sanus Chairman Howard Waltman and President Joseph Lynaugh.

• • •

The Syatems Center and Informatics, Inc. will jointly market software products including the Systems Center's Network Datamover which allows a high level of interaction between Informatics Answer/DB and network elements such as 3270 terminals and IBM personal computers using Visianswer.

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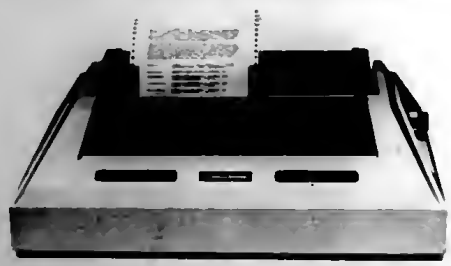

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The accompanying chart summarizes the speeds. Notice that at 10 Pitch and 80 Columns, Speed is 275 Lines Per Minute.

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16.4 Pitch	410 cps
Dual Pass Correspondence Quality	
Proportional	110 cps
10 Pitch	100 cps
12 Pitch	120 cps
10 Pitch Printing Speed (lines/minute)	
40 Columns	430 lpm
80 Columns	275 lpm
132 Columns	180 lpm

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Vector Posts Annual Loss

(Continued from Page 65)

economic slump, increased operating expenses and reduced sales due to competition... We are maintaining a significant level of research and development expenditures and have continued to attract specializing in business computers and vertical markets."

The company has taken several steps to stanch the flow of red ink since announcing its third-quarter losses in April [CW, April 11]. Company co-founder Lore Harp has reassumed control of daily operations, and one-quarter of the Vector Graphic work force has been laid off since April.

However, increasing competition for shelf space, particularly from the mainframe vendors who have jumped on the personal computer bandwagon, has hurt the company, which is fighting to regain the preeminent position it enjoyed, but has lost in the business computer market.

Recently, the company announced it has repositioned its international network of 460 dealers by signing additional value-added dealers, one year after terminating its agreement with Computerland retail computer stores.

According to James Vopicka, the company's vice-president of sales, "Many of our current dealers are specialists in vertical markets... We spent the year searching for new dealers who specialize in this type of consultive selling."

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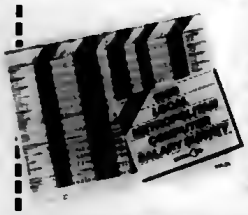

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A programmed expansion to service the user DBMS needs will require individuals with extensive experience in IDMS. Positions involved are a **SYSTEMS PROGRAMMER, SENIOR DATARASE ANALYSTS,** and a **DATA SECURITY ANALYST** to develop and guide data security programs.

PROJECT DEVELOPMENT

To provide the necessary operational guidance, several positions have been planned for individuals to function as **PROJECT LEADERS.** Project experience in a structured development environment designing either technical or complex business systems is required.

APPLICATIONS DEVELOPMENT

Generalized industry experience is necessary for **SYSTEMS ANALYST** positions that will be involved in applications analysis and programming. Minimum experience is 5 years.

AMERADA HESS CORPORATION invites qualified candidates to forward their resumes and salary history for immediate and confidential consideration to:

Employee Relations Department
Information Services Coordinator
AMERADA HESS CORPORATION
P.O. BOX 2040
TULSA, OKLAHOMA 74102

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VAX SYSTEMS MANAGER

A major Atlanta-based high technology firm has a need for a DEC VAX/VMS computer and data communications software and hardware specialist. Successful candidate will be responsible for selection, generation; installation and modification of operating systems, systems level software and general utility programs. You will plan and evaluate new hardware/software, establishing department procedures and standards. VAX systems are being used for CAD, engineering, business and office automation functions.

This challenging Senior position requires BS in Computer Science or equivalent technical experience with 5-plus years in programming (minimum 1 year assembly level and 2 years systems programming on VAX). Experience in configuring, enhancing and maintaining VAX/VMS software in a multiple-VAX, multi-user environment essential. Multiple language skills, including FORTRAN 77, are essential. Some supervisory background desirable.

The firm offers competitive salaries, excellent fringe benefits including dental insurance and relocation assistance.

Send resume with salary history to:

Department SM-198
Post Office Box 56829
Atlanta, Georgia 30343

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COMPUTER SERVICES

Mott Community College has the following openings in its modern Computer Center

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The Manager reports to the Director of the Computer Center, and is responsible for the design, coding, implementation, maintenance and user training material of all MCC administrative computer systems/software. Duties also include supervising assigned analysts and programmers, maintaining these user bases. BA/BS required (MS preferred) in computer science, business, mathematics or related field. Other qualifications include one year experience in COBOL programming, one year supervisory experience, experience in an on-line business environment. Must be available to work any shift, weekends and holidays as scheduled. Starting salary range of $18,401 to $20,400.

MANAGER-COMPUTER OPERATIONS AND DATA COMMUNICATIONS

The Manager reports to the Director of the Computer Center and is responsible for the operation of all computer support facilities, including computer operations training for the MCC staff, customer relations, data entry, processing, libraries, and the inventory maintenance and security of all data communications equipment. College degree (MS preferred) in computer science, mathematics, business or related field. Other qualifications include: working experience with computer operations, data communications and in an on-line business environment, five years progressive relevant management experience. Educational data processing and PRIME computers experience preferred. Must be available to work any shift, weekends and holidays as scheduled. Starting salary range of $15,401 to $20,400.

Deadline for consideration for both positions is Friday, Oct. 14, 1983, at 4 p.m.
Address inquiries for
MOTT COMMUNITY COLLEGE
Personnel Office
1401 E. Court St.
Flint, MI 48503
(313) 766-6888

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WALT DISNEY WORLD CO. has immediate career opportunities within the Technical Support Department for Systems Programmers.

Our expanding corporate configuration at the WALT DISNEY WORLD Vacation Kingdom in Florida consists of a SPERRY 1100/63 supporting a DCA/TELCON network.

Qualified applicants will possess 3-5 years' recent system programming experience on SPERRY 1100 systems.

Candidates interested in a career opportunity should submit a resume with salary history, in confidence, to:

WALT DISNEY WORLD CO.
Professional Staffing MS-5
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- DBA positions require IMS DB/DC, data dictionary internals and utilities. Some require IMS systems software experience.
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Interested professionals ready to accept these responsibilities and opportunities should send resume with current salary to:

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Northrop Data Processing
Dept. 1222/80 NDP-CW 88301
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Hawthorne, CA 90250

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California Federal, one of the nation's largest financial institutions, has immediate openings for high-caliber technical support personnel. Our systems include multiple Sperry 1100/80 and IBM 3083 computers, installed at our new Service Center in Rosemead, California.

Advanced Software Specialist (OS-1100) Provide operating system support to Sperry 1100/80 computers. Experienced in SYSGEN's, TCF application, and panic dump analysis.

Advanced Software Specialist (CMS/TELCOM) Provide TELCON support to five 85 Sperry DCP/40's, controlling 100+ branch network and 300+ in-house terminal system. Experienced in TELCON and CMS support.

Transaction Processing Group Leader Minimum of six years' maintaining or enhancing Sperry 1100 Control Software. Fluent in COBOL and 1100 Assembler. Minimum of two years' technical supervisory experience.

Data Base Group Leader Experience with hierarchical data base management systems in a large business environment. Minimum two years' technical supervisory experience required.

Senior Data Base Specialist (DMS-1100) Minimum of four years' experience using and maintaining DMS-1100. Experience with IBM data base products desirable.

Senior Systems Programmer (CICS) Three to five years' systems and programming experience in current CICS software products, such as CICPARS, DL/I, MRO, ISC, PA II, OMEGAMON CICS. Experience in network products such as ACF/VTAM and ACF/NCP a plus.

Applications Support Analyst Provide technical support to applications programmer/analysts. Heavy COBOL experience in a transaction processing/data base management environment required. Responsible for second-level problem resolution.

Senior Programmer Analyst Responsible for host-to-teller machine interfaces. Minimum four years' COBOL programming experience. Knowledge of a major vendor's Assembler is desired.

Programmer/Analyst Responsible for host-to-teller machine interfaces. Minimum two years' COBOL programming experience.

Senior Hardware Specialist Assist the supervision of all installation and maintenance activities. Extensive knowledge of Sperry (1100 series) or IBM large-scale, multiprocessor hardware configurations, lay-outs, and diagnostic techniques mandatory.

Senior Performance Analyst Experience with System Control Software on Sperry 1100 or IBM 303X systems. Solid performance analysis experience which includes the use of system modeling.

Advanced Software Specialist (MAPPER) Provide MAPPER support, including MAPPER GENs. Plan, test, and implement new releases of MAPPER, and other system processors, as assigned. Knowledge of COBOL, SSG, and ASM required.

Manager, Network Department Responsible for the design and maintenance of a network supporting nearly 1,000 devices. A management track record, with a Minimum of 6 years' experience in DP communications is mandatory.

If you are qualified and are interested in working in a dynamic and professional environment, we would like to talk to you.

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Excellent facilities located in the heart of Portland, yet minutes from uncrowded suburban living. Excellent fringe benefits, equity in the product plus relocation. Because we are a small company, the work of each individual is important. Design teams are small and the atmosphere is informal. Close to skiing, boating, mountain climbing and ocean beaches.

Send resume in confidence to:

Bill Helsten
Servio Logic Product Development Company
2700 Georgia Pacific Building
Portland, OR 97204

Executive Director
University of Alaska Computer Network (UACN)

The UACN provides the University of Alaska campuses statewide with academic and administrative computer and data communications services. The Executive Director will manage the routine operations as well as plan and coordinate computing and data communications University-wide. The UACN will procure new academic and administrative computer systems during FY 84. The successful applicant must have experience managing the routine operation of a computer center, managing a large staff of employees, managing in a complex data communications environment, managing a multi-million dollar procurement, developing and implementing micro/mini/mainframe computer solutions to diverse user computing needs, and handling complex budgeting.

The salary will be commensurate with qualifications and appropriate to the Alaskan economy. The position is based in Fairbanks, Alaska and will report to the University's Executive Vice President.

Letters of application addressing above qualifications accompanied by a current resume and listing of base four current professional references, must be postmarked by September 16, 1983 and be sent to [illegible], Associate Vice President, Human Resources Development, University of Alaska, Statewide Administration, Room 1, Bunnell Building, Fairbanks, AK 99701 (907)474-7024.

Your application for employment with the University of Alaska may be subject to public disclosure should you be among the finalists for the position.

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Management Position in Data Processing

PROJECT ASSISTANT
(DATA BASE ADMINISTRATION)
STARTING SALARY $39,455

NYS Dept of Social Services is currently recruiting for a Project Assistant to coordinate the implementation of the automated welfare management system in NEW YORK CITY.

The environment will consist of 2 Univac 1100/84, DCP 40s, UTS 4000 intelligent terminals, utilizing OS/1100/PIP/COBOL/DMS.

The implementation of this system will require the establishment of a large scale computer facility in N.Y. City. Candidates need to possess 7 years of data processing experience, including 3 years of experience in the technical development of data files and the complex programs and structures of those data files within a large scale on-line data base operation. Applicants must have experience with data dictionary usage, user view synthesis and normalized and logical data base design. College education may be substituted for the general experience on a year for year basis.

The Project Assistant will be responsible for developing and implementing logical data base plans, physical data view, backup and recovery procedures.

Please submit resume to
Director of Personnel, Dept. SME, Box CMP 3

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Associate Director
University Computing and Learning Services

Overview and Description of Position

Ohio University, a state-assisted institution with an enrollment of nearly 15,000 on the main campus and 7,000 on the regional campuses, invites applications for the position of Associate Director, University Computing and Learning Services (UCLS).

This position, reporting to the Director of UCLS, is responsible for administrative data processing, systems management and computer operations. The managers for Systems Development, Systems Support, Technical Systems Support, and Production report to the occupant of this position. This position requires a generalist with a strong technical background which must be complemented by strong management skills and a sound development methodology.

Ohio University's network of computer systems includes an IBM 4341-2, IBM 370/138-II, IBM System 34, HP 1000, HP 2000, HP 3000, DEC VAX 780, DEC 11/44, INTERGRAPH 751 CAD/CAM and multiple micro computers, primarily IBM PCs and Apples. Examples of current operating systems are VM/SP, OS/VS1, CMS, CICS, [illegible], and RSTE.

Qualifications

Bachelor's degree required, master's degree preferred, with ten years of broad-based experience in computer systems, including seven years of progressive supervisory and management experience.

Salary and Benefits

Position salary range is [illegible]. Excellent benefits including a dependent paid tuition program.

Closing Date for Application
September 19, 1983

To Apply

Send a letter of interest with resume, transcript reflecting the highest degree earned and the names of three professional references to: [illegible], Director, Ohio University Computing and Learning Services, [illegible] Hall, Athens, Ohio 45701

Ohio University is an EEO/AA Employer

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SYS PROG - VSE to MVS	[illegible]
P/A - [illegible]	[illegible]
Data Com Networking specialist	40K
P/A - FOCUS	[illegible]
AUDITOR - COBOL/Audit pkgs	[illegible]
P/A - SYS 34/RPG II	[illegible]
Sr P/A - DOS/VSE/[illegible]/CICS	27K

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PROJECT ANALYST
$32,156-$41,038

Bachelor's degree in Computer Science or a related field such as Industrial Engineering, Systems Engineering, Operations Analyst, Quantitative Business or other related field, plus 6 years large scale systems design and programming experience of which 4 years should include experience designing and implementing business applications, incorporating online data base management software techniques in the Burroughs large systems environment using Cobol, GEMCOS and DMS II. Knowledge of COGEN a definite plus.

DATA BASE SPECIALIST
$30,618-$39,062

Bachelor's degree from an accredited college or university in Computer Science or related field plus 8 years of progressively responsible experience in application systems design, file structures, inquiry and access techniques; three (3) years of which must be in data base design, structure, standards, control and administration using DMS II. Working knowledge of GEMCOS, Algol and Cobol.

SENIOR SYSTEMS ANALYST
$30,618-$39,062

Bachelor's degree from an accredited college or university in Computer Science, Management Information Systems, Industrial Engineering, Operations Analyst, Quantitative Business or related field, plus 6 years of progressively responsible experience in User Systems applications, online Data Base Information storage and retrieval in the Burroughs large systems environment using Cobol, GEMCOS and DMS II. Knowledge of COGEN a definite plus.

SYSTEMS PROGRAMMER
$26,459-$33,758

Associates degree from an accredited college or university in Computer Science, Business or Public Administration, plus 5 years programming experience, one year of which must be in systems programming for MCP or GEMCOS and knowledge of Algol in the Burroughs large systems environment. Knowledge of COGEN a definite plus.

Send resumes to:

Samit Roy, Director
Department of Computers
City of Miami
P.O. Box 016429
Miami, FL 33101
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DATA PROCESSING

ACADEMIC COMPUTING PLANNER

THE PENNSYLVANIA STATE UNIVERSITY

The University is seeking an individual to provide central coordination and guidance to University-wide planning initiatives for academic, instructional and research computing.

This new position, reporting to the Director of Computer and Information Systems and Special Assistant to the President, will be responsible for formulating and recommending a long range plan for future university directions to support expanding academic computing needs and will act as liaison with Director of Academic Computing Center concerning long range planning needs.

The individual selected must maintain state of the art knowledge of the developments in instructional and research uses of computers and provide technical information to the academic community regarding this technology. Master's Degree or equivalent in Computer Science or a related field and a minimum of 5 years related experience in management of technical projects and/or academic computing is required.

Send letter of application, resume and salary requirements, to:

Employment Division
117 Willard Bldg., Box CW-7
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In this position, you will use existing knowledge and programs developed and be a key contributor in prototype checkout of Trilogy's new mainframe computer. Individuals will initially participate in the simulation of Trilogy chips and units. You will become a key prototype test engineer and help staff a checkout team debugging the prototype system. You will also be responsible for implementing simulation techniques used in initial checkout. Duties will include using a new simulation system to perform chip and unit level simulation.

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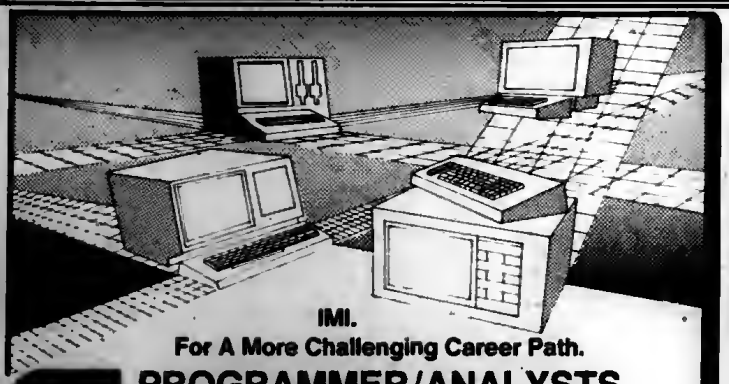

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SOFTWARE MARKETING MANAGER

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Specific requirements include a minimum of 10 years experience in information systems or data processing with at least 5 years devoted to marketing or sales. Working knowledge of several DBMS and/or text oriented retrieval systems preferred. Proven ability to manage a major marketing effort is essential. Will be responsible for developing marketing strategies, literature, advertising plans and negotiating agreements. May also assist in the development of a regional sales force and the implementation of an incentive compensation plan.

This position offers an excellent career challenge for an aggressive, self-motivated individual. We offer a competitive starting salary, excellent employee benefits and an outstanding opportunity to grow with our Software Products Center. Individuals interested in this challenge should send resumes with salary history to Dick Shaw, Employment Department W-2.

Battelle Columbus Division
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GENERAL MANAGER FOR SOFTWARE RETAIL STORE

Our company, a $100,000,000-plus multi-national company specializing in the computer field, is planning to establish an international chain of software stores. We are seeking a General Manager to head up this important project.

The qualified candidate should have experience in setting up and managing retail stores for computer software or related products. He should have a strong background in planning for store operations, promotion and merchandising, multi-store management, inventory management, and profitable retail operations.

The initial stores will be set up in New England with subsequent expansion by the establishment of additional country stores on a national basis, plus selective franchising.

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You must have 3-5 years of data processing experience, including database management system experience, such as Ramis or Focus, and the ability to program in one or more high level languages. Demonstrated ability in advanced report writing and database design is also required. Experience with microcomputer hardware and software is highly desired.

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To qualify, applicants must have extensive experience with IBM 4300, 308X or 303X using DOS/VSE, CICS and VTAM/NCP. To facilitate our move to the OS operating environment some working experience with VM, MVS, DL/1 or IDMS is also necessary. A BS degree, preferably in computer science is required. Advanced degree is a plus.

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An individual is being sought by the State of New Mexico's Information Systems Division to assist in establishing a new innovative direction for communication networks within the State.

The person selected will be responsible for evaluating methodologies, products, protocols, and emerging technologies in voice and data communications. Applicants should have seven years experience in voice and data communications engineering, of which three years must have been in the design and engineering of large-scale communication systems. Applicants should also have knowledge of communication tariffs, SNA, ASYNC, and BYSYNC Protocols. The ideal individual will possess knowledge and experience in Digital Communications, PBX Systems, local area network products and methodologies, preferrably in a multivendor environment using mixed transmission medias.

This position is in the General Services Department located in Santa Fe, New Mexico at a salary of $25,212 - $41,076 depending upon qualifications. For immediate and confidential consideration, please contact or submit your resume and salary history to Otto Howell, Sr., Bureau Chief, Automated Data Processing Bureau, 715 Alta Vista, Santa Fe, New Mexico 87503 (505) 827-5457.

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PROGRAMMER/ANALYST

The desired qualifications for this position include at least 2-3 years experience in data processing including applications programming, systems analysis, management science methods, accounting/financial industrial relations, or manufacturing/engineering or marketing applications; with a BA or BS in mathematics, computer science, business administration or engineering being preferable. Also preferable, is any job-related training, i.e., IBM school.

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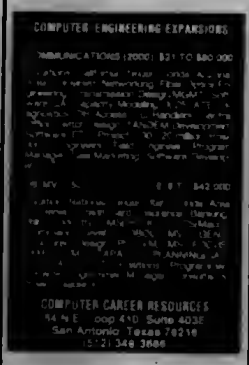

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DATA BASE ANALYSTS - Support of applications in design, coding, and debugging • 2-4 years experience with strong orientation in IMS/DB • MFS, BMP, VSAM, or IMS/DC desirable.

We offer growth opportunity and an excellent benefit package. For consideration, send resume with EDP background to:

Human Resources Department

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3737 Sylvania Ave.,
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For Consultant-Calibre Systems Pgmrs, P/A's for Bus/Fincl. appl's. (IBM-30xx/40xx & Mini-Micro appl's. COBOL; ALC; & DBMS-exp. a +). From 2-10 yrs exp. Earn-to-$60K/yr. equivalency; based in/travel to Europe, UK, Mid-East, etc. Send resume w latest salary, timing & travel-% flexibility to:

H.A. POENACK & Assoc.
10500 Rockville Pike
#1502
Rockville, MD 20852
(301)493-4022.

DIRECTOR OF EDUCATION AND TRAINING

Microcomputer sales company seeks individual to establish and manage new customer training department. Will design, develop, and present classes on microcomputers and related software products. Desire college degree plus 2-4 years of technical training experience in computer related field. Send complete resume of education and work experience to Mr. Marcland

P.O. Box 2151
Louisville, KY 40201
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DATA PROCESSING MANAGER

Rapidly expanding apparel company in Mobile, Alabama seeks Manager for IBM 34. Must program in RPG II. Qualified manager will implement integrated data systems throughout company and join management team. Only experienced, self-motivated should apply. Excellent salary and fringes including good living along Gulf Coast. Respond in detail, including salary requirements, to:
CW-84247, Computerworld, Box 880, Framingham, MA 01701

Coordinator of Library Systems

The coordinator has responsibility for assisting with planning, design, development and coordination of the library computer base systems as well as overseeing existing Data Phase System. Written communication abilities, knowledge of programming, successful experience in automation, and excellent interpersonal skills. Preference given to candidates with experience in libraries. A bachelor's degree is required, preferably in computer science. Salary in range of $[illegible]-$[illegible] for 12 months. Starting date as early as October 1, 1983. To be assured consideration applications should be received by September 15, 1983. Send vita and names of 3 references to: Dwight F. Burlingame, Dean of Libraries and Learning Resources, Bowling Green State University, Bowling Green, OH 43403. BGSU is an EO/AAE.

IMS Systems Programmers

Work on one of the world's largest private on-line networks.

Texas Instruments has immediate openings for senior and intermediate level software professionals in Dallas. Working with our Information Systems and Services Group, you'll be involved in the support of our IMS systems worldwide.

Professional Requirements These positions require a thorough knowledge of IMS internals. Experience in several of the following is preferred: System definitions, SMP, VSAM, VTAM, MSC, XA, CICS, and FAST PATH. Background must also include assembly language programming for IBM mainframe.

Excellent Benefits We'll compensate you for your talents with an excellent salary and comprehensive benefits package. Plus you'll like the endless opportunity for advancement you'll have at TI.

Great Lifestyle You'll like living in Dallas, where recreational and cultural activities abound. Sailing, waterskiing, shopping. Museums and theatre. Major league sports. You'll find everything right here in Dallas. Everything, that is, except city and state income taxes.

Apply Today For more information about our immediate openings, call Paul Patak toll-free at 1-800-255-9204. In Texas call 214/343-7951. Or send your resume in complete confidence to: Paul Patak/Texas Instruments/P.O. Box 225621, M.S. 3609/Dallas, Texas 75265.

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You will be responsible for all management activity associated with personal computer products with a major emphasis on strategic and tactical product direction. Additional responsibilities include market research, competitive analysis, training, developing market strategies and plans.

The successful candidate will have six or more years experience in the data processing or personal computer field. Direct marketing and product planning experience along with demonstrated leadership and proven communication skills are required. An undergraduate BS, BA degree with MBA or equivalent experience is necessary.

We offer an excellent salary, and comprehensive benefits, plus the opportunity to advance with a company enjoying rapid growth. Interested candidates please submit resume with salary history to:

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Computerworld
Box 880
Framingham, MA 01701

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LET'S TALK:

You're invited to come in and speak with us about a career in Data System Engineering. It's no secret we're one of the major high technology firms in the Silicon Valley, but there's a lot more to know about us.

We have openings in all aspects of major system development for skilled people with a minimum of a BS degree and three or more years experience in scientific data systems.

We are especially looking for people with interests in one or more of the following areas:

- Data Systems Simulation
- Computer Sciences
- Mission Data Systems
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- Satellite Test Data Systems
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Experience with Special Access Programs and Current ESH desired.

For immediate consideration, call Pat Martin at 1-800-851-8055 (outside California) between 8:30 a.m. – 4 p.m. PDT Monday – Friday. Within California, call collect 408-743-2200. If you are unable to call, please forward your resume to Lockheed Missiles & Space Company, Professional Employment, Dept. 653-0829, P.O. Box 504, Sunnyvale, CA 94086. We are an equal opportunity, affirmative action employer. U.S. CITIZENSHIP IS REQUIRED.

Lockheed Missiles & Space Company

System Programmer C Language Specialist

Will be required to develop a compiler to translate from code written in a Dbase like language to C code. Compiler is to be written exclusively in C. Job will require experience in compiler design and extensive knowledge of C language in a Unix type environment. References and accomplishments history are positively required and references must be able to be contacted before hiring. Job is located in Tulsa, Oklahoma. Contact: R.Robinson, 918-742-3823, or write to: 7666 East 60th St., #1343, Tulsa, OK 74145

U. of Minnesota-Duluth. Head, new Department of Computer Engineering. Associate or full professor. Immediate tenure possible. Doctorate in computer engineering or related field required. Six years academic or industrial experience required. Salary competitive. Begin January 1, 1984 or as soon as possible. Undergraduate Responsibilities include development of baccalaureate computer engineering program, hiring faculty, some teaching. Upper division (junior level) program to begin fall 1984. Send application letter, vita, and three letters of reference to K. Pierce, 159 Main-Ge-ology, U. of Minnesota-Duluth, Duluth, MN 55812 (218) 726-7391 by Oct. 15, 1983. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities.

Data Base Administrator

Immediate position in Corporate MIS group with Johnson Controls, Inc., a progressive NYSE multi-division manufacturing company headquartered in Milwaukee.

We seek an individual interested in establishing and supervising the *DBA function* within a strategically planned data managed *IDMS environment*. Responsibilities include: *physical data base design, recovery/restart planning, data base implementation and tuning* and *application development support*. Position reports to Data Resource Management Manager in a *large scale OS/MVS IBM-3081* environment.

Degree in computer science or equivalent with several years in data base administration desired. IDMS experience preferred, but will train right individual if extremely sound in physical data base operation, concepts and design. Individual must have good understanding of data dictionary concepts, data resource management philosophy and a strong desire to promote data as a valuable corporate resource.

Competitive salary and excellent fringe package. Send resume in confidence with salary history or expectation to: Ed Beelk, Human Resources Department, Johnson Controls, Inc., 5757 N. Green Bay Avenue, P.O. Box 591, Milwaukee, WI 53201. An equal opportunity employer m/f.

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Engineers

Mainframe Computers

We are a leading designer and manufacturer of commercial computer systems. As a key contributor to Burroughs' world leadership in information management, we offer high levels of individual recognition, mobility and fast-paced development programs. An immediate opening exists for the following individuals.

Manager, Hardware Engineering Department

This multi-disciplinary department is responsible for the hardware development of Burroughs' mid-range mainframe computers. Responsibilities include circuits, power, packaging, cabinetry design, compliance with EMI and safety requirements and reliability. Candidate should have BSEE or MSEE and several years of related managerial experience.

Reliability Engineer

Seeking Engineer who will provide leadership in developing highly reliable and fault tolerant computer systems. Requires BSEE and at least 3 years of experience as a Reliability Design Engineer. Should be proficient in the prediction of failure rates for state-of-the-art digital IC's and new VLSI processes. Will be expected to determine on an on-going basis the electrical and mechanical failure rates for our new computer systems.

EMI Design Engineer

We are looking for that special individual who can deal with digital circuits, PCB's, cables, and related hardware as sources of electro-magnetic interface. Duties will include application of EMI control methods, analysis of effect of design changes, and testing to FCC/VDE specifications. Candidate should have a BSEE and at least 2 years of related experience.

Power System Engineer

Our requirement is for a Power System Design Engineer to be responsible for design, specification and testing of a power subsystem for a mid-range mainframe computer. At least 2 years experience with analog and switcher supplies is mandatory. Knowledge of UPS and fault tolerant techniques is desired. Candidate should have a BSEE or equivalent related experience.

Computer Systems Engineers

Looking for Computer Systems Engineers to work on system architecture, logic design, performance analysis, caches and pipelined CPU design. Should be familiar with state machines, microprogramming, memory systems, etc. Candidates should have a BSEE or BSCS.

Product Assurance Engineers

Responsible for evaluating and qualifying new computer mainframe designs before release into production. An excellent opportunity for quality-conscious engineers to become involved with all phases of product development cycle. Will participate in design reviews, prepare qualification test plans, evaluate designs and monitor field performance of product in user environment. Requires BS or MS in EE or CS and experience in computer evaluation, design, test or programming.

Competitive salaries and benefits and an excellent working environment are hallmarks of Burroughs Pasadena. Please send resume to

Professional Employment
Burroughs Systems Products Group
Dept. CW-0629
460 Sierra Madre Villa
Pasadena, CA 91109

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Burroughs

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Management Position in Data Processing

PROJECT ASSISTANT

(TELECOMMUNICATIONS SUPPORT)
STARTING SALARY $39,455

N.Y.S. Dept of Social Services is currently recruiting for a Project Assistant to coordinate the implementation of the automated welfare management system in NEW YORK CITY.

The environment will consist of 2 Univac 1100/84, DCP 40s, UTS 4000 intelligent terminals, utilizing OS/1100/PIP/COBOL/DMS.

The implementation of this system will require the establishment of a large scale computer facility in N.Y. City. Candidates need to possess 7 years of data processing experience, 3 years of which must have been in support of telecommunications software. Applicant must have experience with communications hardware and software, including Asynchronous and Synchronous protocols, front end support, cluster controllers and networking. College education may be substituted for the general experience on a year for year basis.

The Project Assistant will be responsible for installing, maintaining, enhancing and modifying vendor telecommunications software.

Please submit resume to
Director of Personnel, Dept. SME, Box CMP 4

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P.O. Box 1740
Albany, N.Y. 12201
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Experienced RPG Programmer

The Company-Diet Center, Inc.
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International Operation
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The Work-IBM System/34/36 and Microcomputer
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The Requirements
Two years on-line RPG on the job experience (SDA)
IBM System/34 experience
Accounting Experience Desirable
WSU Experience Desirable

Salary
18K and up

Send Resume to
Personnel Department
Diet Center, Inc.
P.O. Box 180
Rexburg, Idaho 83440

UNIVERSITY OF ILLINOIS

The Computing Services Office, a dynamic, growing computational center for research and instructional computing at the University of Illinois, has two openings.

Assistant Director

Be one of the first to implement a truly integrated digital data network on a large university campus! Have good staff and some existing network fragments. Looking for dynamic, experienced leader with background in data communications who will provide directional emphasis in further development and implementation of a network to reliably service varied computers at diverse locations across campus. Applicants must have: interest in design, development, implementation and operation of computing networks; ability to assimilate new concepts readily; ability to organize and direct a network group; and to work with a diverse group of users, and a willingness to direct this undertaking from its inception to its end. Starting date: after October 1, 1983. Salary: $30,000 - $45,000.

Research Programmer

Full or part-time Systems Research Programmer position also available. Senior Research Programmer preferred; will consider Systems Programmer with excellent qualifications. Offers person with IBM or CDC system experience unique opportunity to apply knowledge and skills, working with several systems. Responsibilities include: working with IBM systems VM, OS/MVT, MVS, and HASP, and CDC a NOS system; installing new releases and products, tuning and debugging; developing new utilities and services, interconnecting multiple CPUs, and interfacing with variety of computers. Applicants should have experience with large operating systems, familiarity with data communications and/or macros, and an ability to work with a diverse group of people. Starting date: after October 1. Salary: $20,000 - $40,000, based on qualifications/experience.

In order to assure full consideration, applications must be received by October 1, 1983. Send applications to:

150 Digital Computer Laboratory
University of Illinois
1304 West Springfield Avenue
Urbana, IL 61801
(Telephone: 217-333-1537)

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RSVP SERVICES
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DIGITAL ELECTRONICS INSTRUCTOR

DIGITAL ELECTRONICS/ SCIENTIFIC SOFTWARE INSTRUCTOR

Full-time tenure track positions starting no later than January 3, 1984 (Deadline for applications: October 14, 1983 or until filled). DIGITAL ELECTRONICS qualifications, BSEE or BSET minimum, preferred qualifications include MSEE and/or doctoral degree in related field; plus expertise in robotics, college level teaching experience; full-time experience in industry; curriculum development experience. DIGITAL ELECTRONICS/SCIENTIFIC SOFTWARE qualifications include all of the above; plus two or more of the following: micro-assembler, Fortran 77, C-Language, UNIX, Pascal, and ADA. Salary very competitive nationally; possibility of summer quarter assignment; outstanding fringe benefit package. Contact: Director of Professional Personnel, College of DuPage, Glen Ellyn, IL 60137, (312) 858-2800, Ext. 2400 or 01.

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COMMUNICATIONS ANALYST

Full responsibility for all Voice and Data Communications at rapidly expanding travel industry company in Southern California. This staff position reports directly to a Vice President.

Requirements
- 3-5 years experience in Data and/or Voice Communication
- 1-2 years experience with PBX philosophy and hardware
- Knowledge of FEX, WATS and TIE lines preferred

Salary commensurate with experience. Send resume and salary history to

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Box 880
Framingham, MA 01701

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Team Up Your Talents With Our Technology

American Express Card Division has the resources and expertise in state-of-the-art systems to offer you the ultimate in a career. Our dynamic Data Processing installation has multiple large scale IBM CPU's (Twin 3081's and 3033) and transaction volumes approaching 1 Million per day. Near term projects include MVS/XA and all related products.

If your talent has exceeded the potential of your present position, you will want to talk to us about the following opportunities.

SENIOR CAPACITY PLANNER

MVS Systems Programmer with 5 or more years experience with operating system internals. Must be thorough planner and knowledgeable in capacity/performance software as well as modeling techniques and statistical analysis.

SENIOR IMS SOFTWARE SPECIALIST

A large size installation data processing background with a minimum of 2 years experience in IMS internals required. Multiple systems coupling experience will prove valuable. Proficient in assembler language.

MVS SOFTWARE SPECIALIST

A large size data processing installation background running under MVS/SP1.3 required. A minimum of 2 years systems programming experience in MVS and JES2 internals required.

MVS SOFTWARE PROGRAMMER

Systems programmer with MVS/3081 background experienced in product installation and support. Exposure to office products such as Displaywriter and WANG required.

We offer an excellent salary and benefits package, which includes your relocation to the Ft. Lauderdale area. Send your resume in confidence to E. Griffin.

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Card Division
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Ft. Lauderdale, Florida [redacted]

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Excellence. Innovation. Progress.

Burroughs is a recognized leader in the electronics-based information management industry. We have developed the expertise and capability to become a complete source for a family of products, including computer systems, office automation products and application software — just to name a few.

Our Systems Development Group in Southern California is a leading designer and manufacturer of medium to large-scale computer systems for information management. We are currently seeking the following individuals:

Data Management

Responsible for the design and implementation for a major effort in advanced data management. Candidate should have strong theoretical and implementation background in data base technology (minimum 3-7 years). DMSII experience would be helpful. Opportunities exist in: **Integrated Data Dictionary • Query Languages and Data Modeling • Forms Management and Application Generators • Data Base Management.**

Data Communications

Responsible for the enhancement and support of Burroughs' Generalized Message Control System (GEMCOS). Applicant should have a strong development background and 3-7 years experience in the area of telecommunications monitors, message routing and control systems, or large on-line application development. Knowledge of Burroughs' large systems, GEMCOS, and ALGOL preferred.

Technical Writer

Our Documentation Department is looking for Technical Writers who will research and write new user manuals and update existing user manuals for environmental and system software products. The ideal candidate is a self-starter, very accurate and able to identify customer requirements. He or she is skilled in writing, analysis and interviewing techniques and possesses a background in both communications and computer science, including a degree in Technical Writing, Communications, Computer Science, or Journalism.

CAD Programming

You will participate in the development and/or selection of state-of-the-art computer-aided-design (CAD) systems. Basic familiarity with schematics, PC routers, simulation, and databases is highly desirable. Requires BS/MS in Computer Science or Programming and 1-2 years related experience.

Microprogramming

Responsibilities for this position include designing and implementing Intel 8086-based applications and requires 2-3 years experience with the Intel iRMX operating system and Intel languages (Pascal, PL/M, Assemblers).

System Modeling

Responsibilities for this position involve performance modeling and performance evaluation of mainframe systems. Requirements include 2-3 years experience in computer systems performance modeling.

Systems Software

Assignments are on a project basis which means greater opportunity for responsibility and advancement. A BS or MS in Computer Science or related field with one or more years applicable experience preferred. Excellent opportunities exist in the following areas:

- **Operating Systems**
- **Computer Network Architecture**
- **Data Communications**
- **Interactive Debugging Tools**
- **Compilers**
- **Message Control Systems**
- **Program Generators**
- **Computer Architecture**
- **Advanced Database Management (Relational and Distributed)**
- **Distributed Processing & Local and Wide-area Networking**

Burroughs Systems Development Group in Orange County's Mission Viejo community offers exceptional salaries and benefits. For consideration, please send your resume to:

Burroughs Corporation
Professional Personnel
Dept. CW-8529H
25725 Jeronimo Road
Mission Viejo, CA 92691
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Burroughs

Engineers and Software Programmers

Growth at BNR INC., in Ann Arbor, Michigan, has created exceptional opportunities for ambitious professionals. We need talented engineers and programmers to participate in the development of advanced data processing systems and their integration with telecommunications networks. The following positions are available immediately:

Senior Software Programmer

Programmer with 3-5 years of experience for leadership role in data communications development. Experience in communications protocols is required, familiarity with IBM 3270 or SNA implementation is desirable.

Quality Assurance Specialist

Experienced software programmer/analyst in the area of systems integration and quality assurance testing. Experience in data communications, 3270, SNA or LAN is desirable. Module and system level testing of software for data communication/3270 - type products. Some test tools development programming is required.

Senior Design Engineer - Mechanical

Self motivated, aggressive individual with a BSME and 3-5 years experience in computer mechanism and packaging design. Knowledge of electromechanics, optics, metallurgy, and chemical properties of plastics/materials is desirable. Must be able to do detail drawings. Applicant will have the opportunity of designing for next generation product development.

We offer excellent compensation and one of the best benefit programs in the industry. For immediate consideration, please send your resume with salary history to: BNR INC., 100 Phoenix Drive, Ann Arbor, MI 48106, (313) 973-4700.

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DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and South west has created opportunities for talented Professionals with state-of-the-art skills in Programming and Systems Design.

We are currently seeking individuals with at least 3 years of diversified programming experience, strong technical backgrounds and who possess the desire to work in various stimulating Data Processing environments. IMS and CICS skills are of special interest as are the abilities to travel or relocate.

We can offer you competitive salaries and comprehensive benefits programs including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that puts people first, then DRC is your answer.

For immediate consideration, please call BECKY FINLEY at 1-800-241-8002, or send your resume to:

DRC DATA RESOURCE CORPORATION
3301 Buckeye Rd
Suite 103
Atlanta, GA 30341
(404) 455 7760

An EOE M/F

Management Position in Data Processing

PROJECT DIRECTOR

STARTING SALARY $48,654

NYS Dept of Social Services is currently recruiting for a Project Director to coordinate the implementation of the automated welfare management system in NEW YORK CITY.

The environment will consist of 2 Univac 1100/84, DCP 40s, UTS 4000 intelligent terminals, utilizing OS/1100/PIP/COBOL/DMS.

The implementation of this system will require the establishment of a large scale computer facility in N.Y. City. Candidates need to possess 12 years experience in data processing and computer operations management, 4 years of which involve the supervision or administrative experience in a large scale data processing environment. College education may be substituted for the general experience on a year for year basis. The Project Director will be expected to direct and coordinate all aspects of hardware and software planning necessary to implement and operate the Welfare Management System in N.Y.C.

Please submit resume to
Director of Personnel, Dept. SME, Box CMP 1

N.Y.S. DEPT. OF SOCIAL SERVICES
P.O. Box 1740
Albany, N.Y. 12201

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COMPUTER PROFESSIONALS

HORIZONS AND OPPORTUNITIES UNLIMITED

HBH Company, a joint venture of three major international organizations, is involved in a celebrated assignment in support of the Royal Saudi Naval Forces. We have the following opportunities available in Saudi Arabia for highly-motivated, experienced computer professionals with IBM expertise for major application in an automated logistic system:

COMPUTER FACILITY DIVISION HEAD
You will assume overall responsibility for the operation of the Computer Facility Division, including resource planning, hardware and software procurement, software development, and supplies management. Experience in computer operations, system software programming, data base administration, and data entry functions required. You should have 15 years experience in data processing with main frame expertise, at least 5 years in supervisory capacity.

SOFTWARE SYSTEMS PROGRAMMER
You will maintain installed system software, evaluate and propose enhancements to backup, security, and other systems software, standards, and procedures. Five years of programming and software maintenance experience required to include VCNA and ACS/VTAM.

SYSTEMS ANALYST
We need a systems analyst to formulate short, intermediate, and long term plans and operating procedures for the data processing system. You will design, develop, and implement plans in data systems structure to meet expanding system requirements. You will also provide technical guidance in computer systems policy. Six years of experience as a programmer analyst is required.

DATA BASE ADMINISTRATOR
You will design, maintain and control the data base and provide for the security, recovery and backup of the data base. You will also maintain the data dictionary, reorganize the data base when required and provide information and training for data base users. You should have six years of programming and/or technical support experience with at least one year of system programming and two years of data base design and management in maintaining ADF, IMS/DBDC and data dictionary software.

PROGRAMMER/ANALYST
You will assist in the evaluation of user operations to identify areas of potential improvement, design program logic, code programs in COBOL, prepare test data, and test programs to validate accuracy. You will also develop training material and assist in training users. You should have two years data processing work experience with at least one year in COBOL programming.

All positions are in an IBM 4341-2 environment, including 3350 Disks, 3203 printers, and 3278 terminals. Experience with the following software systems desirable: OS/VS1, VM/370, IMS/DL1, ADF, CMS, DB/DC, JES, VSAM, GIS, COBOL, BAL. All positions require at least a BS in computer science.

HBH offers excellent salaries and benefits as well as unlimited opportunities to develop your skills in a sophisticated data processing environment. If you would like to find out more about any of these positions, send your resume including salary history in confidence to: Manpower Resources, HBH Company, Dept. DP, Box 1248, Arlington, Virginia 22210. An Equal Opportunity Employer M/F.

HBH COMPANY

Data Processing

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As one of the world's largest information services companies, Computer Sciences Corporation has taken a solid leadership position in the development of technically advanced software systems.

At the Systems International Division of CSC, located in Herndon, Virginia, our continued growth in the development of sophisticated turnkey systems for foreign governments has created immediate requirements for IBM training specialists.

Selected individuals will provide course curriculum development of software-related training materials. In addition, the individuals will provide classroom instruction of foreign expatriate students on the utilization of the IBM 43XX system.

Qualifications include a B.S. degree in Computer Science or related field coupled with a minimum of three years training experience encompassing computer programming applications, IBM mainframe (370 or larger) systems, course development and directly applicable teaching experience.

To learn more about these exciting opportunities, our excellent salaries and comprehensive company-paid benefits, please call/forward your resume in confidence to Paul Gorey, Senior Personnel Administrator, on (703) 471-3206/7.

CSC

COMPUTER SCIENCES CORPORATION
Systems International Division
3001 Centreville Road
P.O. Box 745
Herndon, VA 22070

Equal Opportunity Employer

SENIOR GRAPHIC SOFTWARE ENGINEER—Computervision Corporation, a design and manufacturing leader in the rapidly growing field of computer aided interactive graphic systems for major industries, has an immediate need for a highly skilled Senior Graphic Software Engineer who will be responsible for: (1) the design of graphic display subsystems and device control subsystems for CAD/CAM applications, (2) technical training of new personnel, (3) assuming technical project leadership including the direction and review of the development efforts of junior personnel, (4) interfacing with other technical departments for product development coordination, and (5) participation in direction making concerning product evolution. Minimum requirements include a Master of Engineering degree in Computer and Systems Engineering with a concentration in graphics. Also required is at least 1 year's software design experience for the implementation of graphic display subsystems and device control subsystems for CAD/CAM applications. Also required is demonstrated experience with the TPL or MAD system development languages and a demonstrated knowledge and experience with microprocessor-based hardware. Starting salary is $35,840 per year for a five day, forty-hour work week and includes medical, life and disability insurances, two weeks annual vacation and other industry-competitive benefits. Qualified applicants respond with resume only to: CW-84/84, Computerworld, Box 880, Framingham, MA 01701. An Equal Opportunity Employer.

COMPUTER SPECIALIST

10 month annual assignment

Starting: 10/83

Salary: $20,211 - $24,255

Qualif: Bachelor's degree in related field, (master's degree preferred). Background, interest and skills in computer literacy, computer-assisted and computer managed instruction. Previous exper. in computer teaching at the post-secondary level and/or industry exper. in computer literacy, computer-assisted and computer managed instruction. Strong and effective conceptual communications skills. Knowledge of telecommunication concepts, strategies and tools. Knowledge of state-of-the-art instructional computer technology. To Apply:

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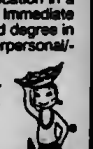

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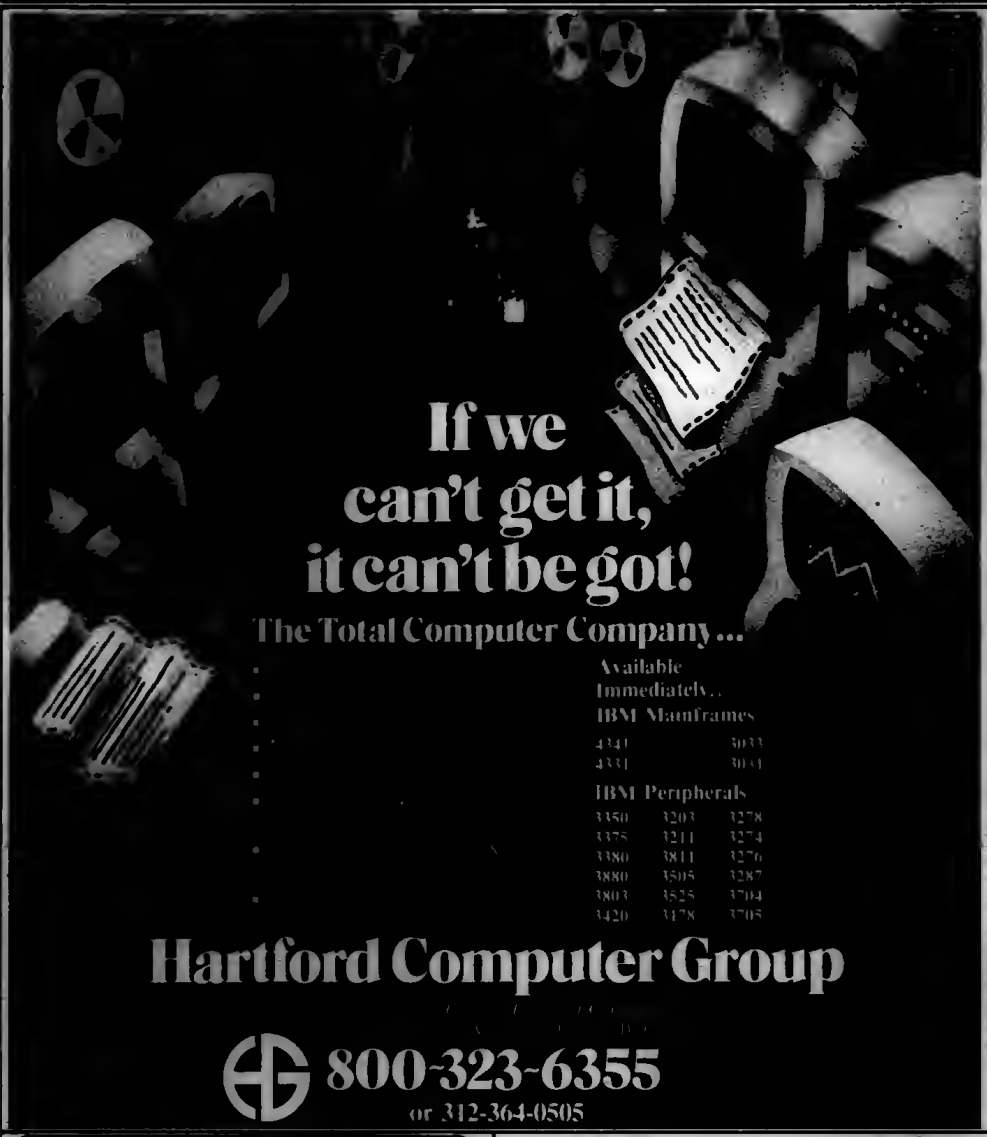
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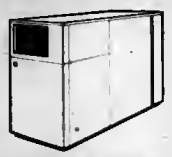

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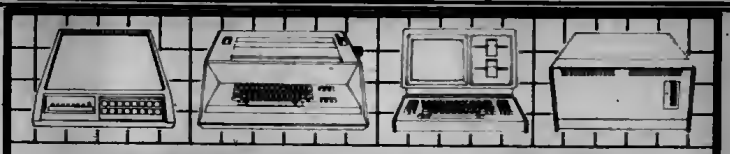

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It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Rates: Open rate is $112.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $225.40 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

1 col X 4" - 450.80
2 cols X 4" - 901.60
2 cols X 5" - 1127.00
2 cols X 8" - 1803.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, $15 per insertion.

Ad closing is every Friday, 6 working days prior to issue date.

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617)879-0700
New York - (201)967-1350
Chicago - (312)827-4433
San Francisco - (415)421-7330
Los Angeles - (714)556-6480

William J. Mills, Manager Classified Advertising

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

SPERRY UNIVAC

NEW UNIVAC 1100/61 C2
Available Immediately. ITC Available. Maintenance Guaranteed. Very Large Discount - Configuration Included - 3 (3) MB Processor, 2,000 MB Disk (2 x 4), (3) 6,250 Tape Drives (U-38), 1200 LPM Printer, 750 LPM Printer, GCS, 7 Ports and Modems.
Direct From Owner
(613) 461-4001 or (613) 461-6275

V-77 800 SYSTEM
(2) 256K CPU w/2 Pages WCS
(2) 8433/20 200 MB Disk Drives
(4) 10 MB Disk Drives
(2) 800 bpi Tape Drives
(2) 800/1600 bpi Tape Drives
(1) 300 LPM Printer
(1) 800 LPM Printer
THE EXCHANGE (800)544-7000
Ask for TOM BASS

MISC. SYSTEMS

Datapoint

4750	256K/120Mb	$35,000
9213	Printer	$3,900
9621	Printer	$1,400
8211	(3) CRTs	$1,050 Ea.

Phone Stan Nystrom
816-587-8466

DATAPOINT
(33) 3601 CRT's
$585. each
Commercial Computer Systems, Inc.
(504) 927-5930

CODEX
(2) LSI 9.6KB Modems
(2) #6001 & CH Stat. Multiplexers
PICK UP LEASE
Modem @ $140 Each/Mo
Multiplexer @ $95 Each/Mo
Or Purchase For Balance Owed.
Call Doug Or Gary @ (213) 704-6864

WANG

ISN'T IT TIME YOU MANUFACTURED YOUR SOFTWARE?
VS COBOL
COMPUTER AIDED PROGRAMMING
CAP *Speeds Development*
CAP *Improves Control*
CAP *Reduces Maintenance*
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Downsview Toronto, Canada M3J1Y9
(416)636-6333

THE BIGGEST WANG
dealer in Wang Equipment & Plug Compatible has ADVANCED PRODUCTS!
* VS-80 to 2 MEG
* VS Universal IOP
* 2200 CPU for Phoenix and 300 MEG
CALL STANDARD DATA
Advanced Products Department
800-638-0791 301-984-0900

For Sale
WANG OIS-130
Refurbished
Incl: CPU, 10 Meg Disk, Wk. Sta. & Daisy Ptr $13,500
617-372-8536
Mr. Dwight Krantz

VS80
512K Memory, 16 Port Serial IOP, Disk/Tape IOP's, 80MB Disk, 1600BPI Tape Drive, 600LPM Band Printer, Daisy Wheel Printer, 2 Ergo-2 Combined WS, 6 Ergo-2 DP/WS, WP Software. Asking $80,000.
Call David 415-827-1212

Pssst... WANG USERS.....
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I.C.A. (404) 977-4360 or 1-800-341-3159

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L62, L64
L6000, L6600
PERIPHERALS
TERMINALS
URS
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Stoneham, MA 02180
(617)438-4300

HEWLETT PACKARD

HP 3000
BUY & SELL
Complete Systems
Memory • Terminals
Disk Drives • Tape Drives
Miscellaneous Parts
ComAm Corporation
(Formerly Finley & Associates)
(800) 648-4864
(312) 466-3848

For Sale
HEWLETT PACKARD

7976A	6250BPI Tape Drive
7920S	50MB Disc Drive
7925M	120MB Disc Drive
7925S	120MB Disc Drive

Contact: Dave Ickow
(312) 352-0365

BASIC FOUR

Basic Four - Model 4002 - Level 2
(1) CPU (2) 10 Meg Drives
(1) 8-Way Controller
(3) 16K MOS Memory Boards
(1) 8K MOS Memory Board
(1) Print Controller
(8) Disk Packs
Sold As Complete System Or Parts
Contact Superior Jewelry Company
Tom Schorn - 1-800-545-1946

DEC

USED DISK PACKS
Guaranteed
RL01, RK06, RK07
Used VT52 CRT's
ADM-36, New
1134A, Used
EDS (701) 237-0000

DEC SYSTEMS

11/03 systems w/RL01 disk, LA180 printer, 64KB memory, RT-11 license	$4,500
Complete packaged 11/23 systems with dual RL02	$12,095
11/03	$4,250
LA180 pers. w/interface & cntr	$375
Other Configurations	CALL

S.E.C. Systems Inc. (617)643-5160

BUY • SELL • TRADE

1134A	$3995	KDF11-AA	$995
1145	$6495	MS11-LD	$1395
BA11-KE	$1995	RH780	$2995
DLV11-J	$450	RH711-EA	$5700
DMC11-AL	$1195	RP04/6-C	$2995
DMC11-MD	$1095	TM11-EA	$1995

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BUY — SELL — EXCHANGE
Systems • Processors • Memory
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[illegible]
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NCR 8251 With 96K Memory, (2) 10 Mb Rack Mounted Disk Units, (1) 10 Mb Stand Alone Disk Unit, Cassette Unit, Stand By Battery, (3) CRTs, (1) 200 LPM Band Printer With Quiet Cabinet, (1) 55 LPM Matrix Printer. Under Current NCR Maintenance. Software Option Available. All Or Part. Call Andy Jackson Or Mike Schorn At (405) 236-7900

IBM

For Sale
The IBM Office System 6
with processing feature + impact printer, used 1½ yrs., been certified for continued maintenance.
Call Phil Wert
317-459-5126
8:00 am to 4:00 pm

FOR SALE
AVAILABLE IMMEDIATELY
IBM 34II Model-3
Single Density
Tape Drive
System 36
With CPU Attachment
Call Ed Jackson
213-583-1356

SYSTEMS 34/36/38
Lease or Sale
WANT TO BUY S/34's
(FOR INVENTORY)
Models & Peripherals
WE PAY CASH
LEAS PAK INTERNATIONAL
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SYSTEMS 36 LEASES
RATES LOWER THAN PRIME
PROCOM
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Operating leases! System/36's
We beat IBM month-by-month rates by 10-40% on multiple installations. Will handle site-by-site and take 34's in trade. (203) 222-0170.
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For Sale
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Call Dick Boyce
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SYSTEM/36's
Avail. Now
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* S/34 Trade-ins *
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Will Lease All or Part
SYSTEM 38
Model 581
Includes the 3370, 3411, and 3262
4 Months Old
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For Sale
(4) IBM 5280's
Each has (4) keyboards (two dual stations), (8) diskette readers and communications. (3) have printers.
Available Dec. 1983.
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SYSTEM/36
Check Our GREAT Lease Rates
SYSTEM/34
We want to buy
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System 36
For Sale or Lease
Model B24
512K-400Meg with MLCA
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415-339-0901 Jon McCurdy

IBM

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CRT's & Printers
5291's, 5224's, 5225's
Available immediately with complete IBM systems. Call regarding our flexible lease plans.
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S/34 S/38 43XX
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Available Now
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w/6303, 7060
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5340-C14 Minimum
64K/64 MEG
Display Stations and Printer
Gerald Tyglelski
1-800-241-7256

FOR SALE
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2520-B1
3203-5
3344-B2F
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Computer Merchants Inc.

FOR SALE
S/38
1MB CPU-256MB Disk
Save 22%
Call Ron Gibb
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Euclid, OH 44132
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IBM 1416 & 3216
Bought - Sold - Lease
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More Bulletin Board on the next page.

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4114A & 4112A
NEVER USED
PRICED FOR IMMEDIATE SALE
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6580-3/2280N-3 Equiv., "Phoenix" w/Stand, Cables $8,300
2236-DE Equiv. "Ergo" Wk Station, Brand-New $1,480
2263-Equiv. Chain Train Ptr., 600 LPM Refurb'd, Like New $3,400
Wang 2231-W Matrix Ptr., Refurbished $790
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[illegible]
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HONEYWELL

LEVEL 6 & DPS 6
Refurbished Parts & Complete Systems
[illegible]

Desc.	New Price	Your Price
CRT's		
VIP 7200	$1980	$850
VIP 7201 (new)	795	750
VIP 7300 (various)	1500	1001
VIP 7801	3060	1442
DISKS		
256MB Drive in Cab	$33000	$21480
67MB Drive In Cab	16300	12545
80MB Phoenix	15200	9880
26MB Phoenix	12700	8255
10MB Hawk	8400	3565
TAPE		
800/1600 BPI, 75IPS	$16780	$10884
800/1600 BPI, 45IPS	13300	8645
800BPI, 45IPS	8400	4300
PRINTERS		
600LPM	$8400	$5646
800LPM	12000	4980
180 CPS	3360	2184
120 CPS console	2880	985
COMMUNICATIONS		
Dual ASYNC	$1000	$650
Dual SYNC	1600	750
Dual Auto Call	1095	350
Single SYNC	1000	395
Current Loop	1000	750
MLCP	2500	1895
CPU OPTIONS		
Writable Cntrl Store	$6600	$2240
L6/47 (Clip)	15300	9950
Scientific Proc(SIP)	3300	1600
MISCELLANEOUS		
Console Pac	$315	$225
Printer Pac	980	595
MDC	1905	690

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RA81-AA, new	VT52
RUA81-AA, new	CDC-9766
RA80-AA, new	DH11-AE
RUA80-AA, new	DD11-CK
Emulex SC70	LA180
Emulex SC21	BA11-KE

VT52 printer interface
Sheet feeder for Diablo 630
LA180 serial interface
VT100 current loop interface
Micom 804 error controllers
(806) 792-3795
Compu-Share • Lubbock, TX

DEC BARGAINS

FP11A	$1185
BDV11-AA	$485
KK11-B	$2675
PDP 11/34A-DC	$3350
RX11-BA	$1185
VAX 1MB MS730-CA	$3,950
VAX 1MB MS750-CA	$3,950
11/34A CPU Set	$1,585
11/44 KE44-A 'CIS'	$2,975
DZ11 MUX Brd.	$1,125
DR780-AA	$11,200
4A-MS780-C Spares Kit	$7,800
MSV11-PK	$1175
MSV11-PL	$1575
FP750	$5100

CALL RAY
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Call For Your DEC Needs

861-C	$300	BA11-KE	$1,880
DD11-CF	$360	DL11-W	$425
DZ11-A	$2,195	H754	$295
RH780	$5,995	RKV11	$695
RP06-BA	$16,000	TU45-KE	$3,995

Pacific Computer Sales, Inc.
(408) PDP-1170
Telex 172837

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IBM 3031 - 6 meg.
Sale or Lease
Available Immediately
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IBM SYSTEM 32
MODEL A22
SERIAL # 10763
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IBM System 34
256MB/256K
Magazine Drive
CPU Only
Ron Pleer
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602-298-1991

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3540-B1
3747-1 w/1660 & 7885
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The Bulletin Board

The Bulletin Board

The Bulletin Board

DATA GENERAL

For Sale
Special
MV 8000/8000
Memory Boards
All Sizes Available
We Take Trades
On All Sizes

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MV 8000 System Loaded	Call
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M600 Eclipse System 1/2Mb	$16,000
8706 MV 8000/8000 Memory	Call
8703 MV 8000/8000 Memory	Call
8958 256 Kb Eclipse Memory	$2,900
8957 256 Kb S/140 Memory	$2,900
8387 256 Kb Nova-4 Memory	$2,900
4080 Dasher TP1	$500
6099 12.5 Mb Disk Subsystem	$3,100
6051 182 Mb Disk Subsystem	$18,000
6061-A 192 Mb Disk	$14,500
6061-H 192 Mb Disk Subsystem	$17,000
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6122 277 Mb Disk Subsystem	$22,500
6122-A 277 Mb Disk	$19,500
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4255 ALM-8	$1,350
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International Computing Systems Co
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Call For Any Of Your DG Requirements

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Service available in New York
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6122-A 277MB Disk	$20,000
6125 Tape System	$5,500
8732-N S/120 256KB	$8,000
8718 C/150 1MB Mem Bd	$2,200
4342 ATI-16	$3,000
6520-D MP/100	$750

Ames Sussman
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(1) 14 Controller PCP
(3) C150's 512K
(3) 192 MB disk
(1) MCA Channel
(1) 1600LPM Printer
Contact:
Purolator Courier, Corp.
(516) 864-3420

6168 D210 VDT New	$830
6168 D211 VDT New	$995
6168 D410 VDT New	$1350.
8353-K NOVA 4X, 128KB, 4d/D	$4900.
8703 512KB MV8000 MOF	$2500
8708 2MB MV8000 MOF	$7500
4254 DCU 200	$2800
8678-R S/140 512KB/FIS	$15,900
6446 C/300 Eclipse 192KB	$3800
6096 12.5MB w/F	$4200

Data Investors (201) 836-7991

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For Sale
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CRT 120 CPS
Bi-Dir-Ptr.
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48K mem
Full Accounting Package
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ORDER FORM
COMPUTERWORLD
BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be clearly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $115.00 (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Date(s): _____

Signature: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Send this form to:
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375 Cochituate Road, Box 880,
Framingham, MA 01701
617-879-0700 **800-343-6474**

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ACCOUNTING AND COMPUTER TECHNOLOGY, INC.
offers
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7.	FA – Fixed Assets/Equipment Maintenance	$ 2,000.00
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Application Software

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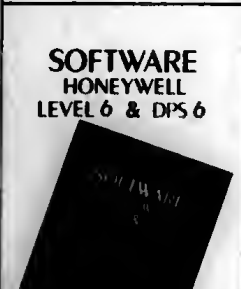

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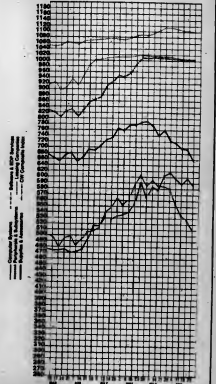

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Computerworld Stock Trading Summary

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge Mass 02139

CLOSING PRICES WEDNESDAY, AUGUST 24, 1983

EXCH		1982-83 RANGE (1)	CLOSE AUG 24 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	AMDAHL CORP	8- 30	17 1/8	-3 7/8	-14.3
N	BURROUGHS CORP	25- 58	51 3/8	- 5/8	-1.1
O	COMPUTER AUTOMATION	7- 17	12 1/4	- 3/8	-2.2
A	COMPUTER CONSOLES	8- 26	20 1/8	- 3/4	-3.8
N	CONTROL DATA CORP	21- 62	20 3/8	-3 1/2	-6.4
N	CRAY RESEARCH INC	20- 52	40 1/8	-5	-11.0
N	DATA GENERAL CORP	20- 74	53 3/4	-5 7/8	-9.7
N	DATAPOINT CORP	11- 30	18 2/8	- 7/8	-4.2
N	DIGITAL EQUIPMENT	62-132	85 1/2	-1 3/8	-1.7
N	EECO INC	6- 16	14	- 3/8	-2.8
N	ELECTRONIC ASSOC.	2- 12	13 3/8	- 1/4	-1.8
N	FLOATING POINT SYST	18- 44	38	+2 1/4	+6.1
N	FOXBORO	22- 47	34 5/8	-1 1/8	-3.1
O	FULCRUM CORP ORP	1- 3	1/4	0	0.0
N	GENERAL AUTOMATION	2- 18	10	-2 1/8	-17.2
N	HARRIS CORP	20- 21	35 1/2	-3	-5.3
N	HEWLETT-PACKARD CO	38- 94	78 3/8	-2 1/8	-6.1
N	HONEYWELL INC	60-130	114 1/4	-3 3/8	-2.2
N	IBM	57-128	118 1/2	-6 1/2	-5.2
O	IPL SYSTEMS INC	8- 14	8 3/4	0	0.0
O	MAGNUSON CORP SYSTS	2- 2	1/2	- 1/4	-33.3
N	MANAGEMENT ASSIST	7- 18	8 3/4	- 1/8	-1.2
O	MINI-COMPUTER SYST	1- 2	1 1/4	+ 1/8	+11.1
N	MODULAR COMPUTER SYS	6- 16	14 1/8	0	0.0
N	MOHAWK DATA SCI	10- 18	13 3/8	+ 1/2	+3.8
N	NCR	38-128	111	-4 7/8	-4.2
N	PERKIN-ELMER	17- 39	38 1/8	- 7/8	-2.5
N	PRIME COMPUTER INC	11- 38	18 1/8	- 1/8	-6.4
N	SPERRY CORP	21- 44	42 1/8	-1 1/8	.5
A	TANDEM COMPUTERS INC	14- 34	30 3/4	- 7/8	-2.7
N	TEXAS INSTRUMENTS	71-176	114 1/4	+5 3/2	+5.1
A	WANG LABS "B"	13- 42	28	-4 1/3	-13.4
A	WANG LABS "C"	11- 42	28 1/8	-3 7/8	-11.8
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	11- 30	28 1/2	- 1/2	-1.7
N	COMDISCO INC	7- 43	38 1/4	-1 1/2	-3.8
Z	COMMERCE GROUP CORP	1- 1	1/4	2	2.8
O	COMPUTER INVSTRS GRP	1- 2	1	2	2.2
O	CONTINENTAL INFO SYS	2- 18	13 3/4	- 1/4	-1.7
N	DPF INC	5- 14	11 1/4	- 5/8	-5.2
O	ITEL	1- 8	1 1/2	0	0.0
O	LEASPAC CORP	1- 8	1/8	0	0.0
N	U.S. LEASING	18- 47	38 1/8	- 7/8	-2.2
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	5 1/2	+ 1/4	+4.7
O	ADVANCED SYSTEMS INC	8- 22	18 3/4	+ 1/2	+2.7
O	AGS COMPUTERS INC	7- 32	27 1/8	+ 7/8	+3.3
O	AMERICAN SOFTWARE	21- 31	24	+1	+4.3
N	ANACOMP INC	5- 23	11	-1 1/2	-12.0
O	ANALYSTS INTL CORP	8- 20	14 1/4	+ 3/4	+5.2
A	APPLIED DATA RES.	8- 37	27 1/8	- 3/4	-2.6
O	ASK COMPUTER SYSTEMS	12- 38	33	- 3/4	-2.2
O	AUTODYNE CORP INC	1- 7	4 5/8	- 1/8	-2.8
N	AUTOMATIC DATA PROC	21- 44	36 1/4	- 5/8	-1.6
O	CGA COMPUTER ASSOC	5- 19	12 3/4	+1 3/8	+12.0
O	COMPUTER ASSOC INT'L	6- 35	28 8/4	-1	-3.2
O	COMPUTER HORIZONS	8- 20	13 1/4	- 3/4	-5.3
O	COMPUTER NETWORK	4- 16	7 5/8	- 7/8	-10.2
N	COMPUTER SCIENCES	11- 23	17 1/8	2	0.0
O	COMPUTER TASK GROUP	8- 23	14 1/2	0	0.0
O	COMPUTER USAGE	2- 23	18 3/8	- 1/4	-1.3
O	COMPUTONE SYSTEMS	8- 38	8 1/2	- 3/4	-8.1
O	COMSERV CORP	10- 20	10	+ 1/4	+2.5
O	COMSHARE	8- 13	11 5/8	+ 3/4	+7.0
N	CULLINET SOFTWARE	12- 50	38 7/8	- 7/8	-2.1
O	CYCARE SYSTEMS INC	8- 27	18 1/4	- 1/2	-2.8
O	DATA DIMENSIONS INC	1- 8	3/4	2	0.0
O	DATORIA	0- 3	1 3/8	0	0.0
O	DYATRON CORP	2- 4	3 1/8	+ 1/2	+4.1
N	ELECTRONIC DATA SYST	10- 42	33 1/2	-2 3/4	-7.8
N	INFORMATICS INC	10- 38	33 7/8	- 5/8	-2.8
O	ISATTE CORP	1- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 18	11	- 1/4	-2.2
A	LOGICON	12- 34	27 7/8	-2 1/8	-8.3
O	MGMT SCI AMER INC	8- 33	27 1/2	- 1/2	-1.7
O	MATHEMATICAL APP GRP	12- 33	15 1/2	+ 1/2	+3.3
O	NATIONAL DATA CORP	3- 28	18 1/8	-1	-5.2
O	PANSOPHIC SYSTEMS	8- 30	23 1/4	+ 1/2	+2.1
O	PLANNING RESEARCH	8- 31	17	- 1/8	-0.7
O	POLICY MGMT SYSTS CP	30- 34	36	-2 3/4	-4.8
O	PROGRAMMING & SYS	1- 8	4 7/8	- 1/8	-2.5
O	REYNOLDS & REYNOLDS	17- 53	52 1/2	+4 3/4	+8.0
O	SEI CORP	11- 20	24 3/4	+ 3/4	+3.1
O	SHARED MEDICAL SYST	12- 43	38 1/2	- 5/8	-1.5
O	SCIENTIFIC COMPUTERS	8- 14	11 8/4	- 1/2	-4.0
O	SOFTWARE AG	8- 17	8 3/8	- 1/2	-2.0
N	TYMSHARE INC	12- 30	23 5/8	+4 3/8	+23.0
O	UCS CORP	8- 18	12 1/2	+ 5/8	+2.4
O	WYLY CORP	7- 17	10	- 1/8	-0.8
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	8 1/8	+ 5/8	+11.3
O	ANDERSON JACOBSON	8- 38	18 1/2	-1 1/8	-8.3
O	AUTO-TROL TECHNOLOGY	8- 29	33 1/8	- 7/8	-3.8
O	BANCTEC INC	7- 33	12 1/2	-2 1/4	-12.0
A	BEEHIVE INT'L	4- 18	18 1/4	- 2/8	-5.7
O	BOLT,BERANEK & NEW	8- 30	48 5/8	-1 1/8	-8.3
O	CAMBEX CORP	2- 8	3 7/8	+ 1/2	+21.0
N	CENTRONICS DATA CORP	8- 38	22 3/4	- 5/8	-1.5
Z	CETEC CORP	4- 12	8 2/8	- 1/8	-1.2
O	COGNITRONICS	2- 38	11	+ 1/8	+1.1
O	COMPUTER COMMUN.	1- 2	2	0	0.0
O	COMPUTER DEVICES INC	4- 21	4 8/8	+ 1/8	+2.7
O	COMPUTER TRANSCEIVER	4- 12	8 3/4	+ 1/4	+3.0
N	COMPUTERVISION CORP	18- 53	45 1/8	-3 8/8	-7.4
N	COMPAC CORP	17- 38	18 7/8	-1 8/8	-8.7
N	DATA ACCESS SYSTEMS	1- 4	1 1/4	+ 1/4	+25.0
A	DATAPRODUCTS CORP	18- 41	24 7/8	-1 3/8	-8.7
O	DATARAM CORP	2- 12	11 7/8	+ 1/4	+2.1
O	DATUM INC	2- 17	8 7/8	- 7/8	-9.1
O	DAVID JAMISON CARLYL	2- 7	3 3/4	- 1/4	-6.3
O	DECISION DATA COMPUT	2- 18	10 5/8	- 3/4	-6.6
O	DELTA DATA SYSTEMS	1- 4	2 7/8	- 5/8	-17.8
N	ELECTRONIC M & M	5- 11	8 1/4	0	0.2
O	EVANS & SUTHERLAND	18- 28	41 3/4	-1 1/4	-2.2
O	GANDALF TECHNOLOGIES	8- 27	8 8/8	-1 1/2	-14.2
N	GEN'L DATA COMM IND	8- 28	33 3/4	- 1/4	-1.8
O	GENERAL TERMINAL CP	1- 2	5/8	- 1/8	-25.4
O	GREAT SOUTHWEST IND	2- 8	1 3/4	0	0.0
N	HAZELTINE CORP	7- 31	37 1/4	+ 3/4	+2.8
O	ICOT CORP	2- 18	4 8/8	- 1/8	-2.8
O	INFORMATION INTL INC	10- 23	18 3/8	-1 3/4	-8.4
O	INTEL CORP	31- 45	37	-1 3/4	-4.8
O	IPL SYSTEMS INC	8- 14	8 3/4	A	2.0
N	LUNDY ELECTRONICS	7- 18	14 1/4	-7 3/4	-18.1
N	MAI DATA CORP	14- 38	18 8/8	- 2/8	-3.2
O	NETWORK SYSTEMS CORP	6- 28	27 1/8	-3 7/8	-14.2
O	ONEX	3- 8	8	0	0.0
N	PARADYNE CORP	14- 20	14	-1 7/8	-11.8
N	PERTEC CORP	7- 14	12 7/8	-1	-8.4
O	QANTEX CORP	12- 28	18 3/4	+ 3/4	+4.8
N	RECOGNITION EQUIP	4- 17	12 2/8	- 7/8	-6.4
A	SCAN DATA	1- 3	1 1/8	- 1/4	-18.8
N	STORAGE TECHNOLOGY	18- 33	18 2/2	- 1/4	-1.2
O	SYKES DATATRONICS	6- 27	8 5/8	-8 3/4	-28.8
A	T BAR INC	7- 17	11 3/8	- 3/4	-6.1
N	TBA PRODUCTS CO	6- 30	28 1/2	0	0.0
N	TEC INC	6- 12	7 1/8	+ 1/8	+1.7
N	TEKTRONIX INC	34- 87	70 3/4	-3 1/4	-4.3
N	TELEX	2- 32	28 1/4	-1 3/8	-4.8
O	TESDATA SYSTEMS CP	2- 17	13 1/2	- 2/8	-4.8
N	TIMEPLEX INC	7- 28	21 7/8	+1	+4.7
O	VISUAL TECHNOLOGY	8- 28	18 3/4	+ 1/4	+1.3
O	WILTEK INC	1- 2	1 8/8	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 31	30 1/2	+ 3/4	+2.5
O	BALTIMORE BUS FORMS	1- 3	1 1/4	0	0.2
N	BARRY WRIGHT	02- 31	27 3/8	-1 1/4	-4.3
O	CYBERMATICS INC	1- 2	1 1/4	2	0.0
N	DUPLEX PRODUCTS INC	12- 28	22 8/8	- 1/8	-1.4
N	ENNIS BUS. FORMS	8- 28	21 7/8	+ 1/2	+2.3
N	3M COMPANY	40- 94	78 1/8	+ 1/4	+4.3
N	MOORE CORP LTD	28- 21	84 8/8	+ 2/8	+1.4
N	NASHUA CORP	5- 28	28 7/8	-1 7/8	-7.0
N	STANDARD REGISTER	11- 38	27 1/2	-4 3/4	-14.7
N	WALLACE BUS FORMS	11- 30	23 3/4	- 1/4	-0.8

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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